LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT

of the

COUNTY ANALYST

for

THE YEAR 1964

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PUBLIC HEALTH AND HOUSING COMMITTEE

(1965)

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County Alderman Fred Longworth

The Vice-Chairman of the County Council :

County Alderman Henry Lumby, c.b.e., j.p.

The Chairman of the Finance Committee :

County Alderman J. Selwyn Jones, j.p.

The Chairman of the Health Committee :

County Alderman T. Hourigan, j.p., m.a.

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LANCASHIRE COUNTY LABORATORY

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Miss S. Harpley

Laboratory Attendants :

Mrs. M. Clitheroe
Mrs. M. Saunders

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST FOR THE YEAR 1964.

To the Chairman and Members of the Lancashire County Council.

I have the honour to submit for your consideration my nineteenth Annual Report which deals with the work carried out in the County Laboratory during the year ended 31st December, 1964. The total number of analyses and tests carried out in this period was 12,659. In order to facilitate reference these have been grouped under the following headings :—

Part I. Report on samples taken under the Food and Drugs Act, 1955. Page 9.

Part II. Report on Heat-treated Milk Samples taken under the Milk (Special Designation) Regulations, 1960 and 1963. Page 115.

Part III. Report on samples taken under the Fertilisers and Feeding Stuffs Act, 1926. Page 120.

Part IV. Report on Waters, Effluents, etc. Page 127.

Part V. Radioactivity. Page 135.

Part VI. Miscellaneous (including Atmospheric Pollution). Page 144.

The number of samples examined for the County under the Food and Drugs Act and the Fertilisers and Feeding Stuffs Act (excluding, however, milk samples submitted for Phosphatase, Methylene Blue or Turbidity Tests) was 7,832. The number of Food and Drugs samples submitted by the 13 Autonomous Food and Drugs Authorities, for which your Analyst acts as Public Analyst, was 2,285.

The number of Food and Drugs samples (excluding appeal-to-cow samples) submitted by the County Sampling Officers during the year 1964 was 7,766 as against 8,243 during the previous year and 8,784 in the year 1962 ; the rate of samples per 1,000 of the population was 5·41 in the year under review, 5·39 in 1963 and 5·86 in 1962.

The number of County Food and Drugs samples has, therefore, been maintained well above the level reached in 1947 (6,819). Prior to 1947, the highest figure was 5,263 in the year 1933. During the year the number of samples found to be adulterated or unsatisfactory was 562 ; this corresponds to an adulteration rate of 7·2 per cent., as against 5·8 per cent. in the year 1963, and 3·8 per cent. in the year 1962. Table 4 gives the percentage adulteration for the last 10 years and it will be seen that the figure for the year under review is the highest in the table, although there has been an appreciable drop over that period compared with the years 1941 to 1948 when the adulteration rate varied from 9·3 to 5·7 per cent. Viewed in the light of the last mentioned figures the adulteration rate for the year 1964 cannot be regarded as unsatisfactory although it is higher than in the years immediately preceding the war when the percentage adulteration varied from 2·6 to 4·2. The rise in adulteration rate during the year under review compared with the corresponding figures in the years 1963 and 1962 is mainly due to the increased testing of samples of milk and Channel Islands milk for the presence of antibiotics.

In addition to Food and Drugs samples the County Sampling Officers submitted 1,112 samples of heat-treated milk for examination by the Phosphatase test, the Half-hour Methylene Blue test or by the Turbidity test as against 1,505 samples submitted in the previous year. Of these, three failed to pass the Phosphatase test and six samples failed to pass the statutory Methylene Blue test. None of these unsatisfactory samples were taken at pasteurising plants. The corresponding figures for the year 1963, being three and 12 respectively. All the 93 (91 from 1st April) County Districts comprising the County Food and Drugs Area during 1964 are Specified Areas in which only designated milks may be sold. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows that samples of designated milks are being taken by County Sampling Officers for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests.

As usual nearly two-thirds of the Food and Drugs samples submitted by the County Sampling Officers consisted of samples of milk. Of 4,268 milk samples, 319 were found to be adulterated which represents an adulteration rate of 7·5 per cent. The corresponding figure for the year 1963 was 5·1 per cent. and for the year 1962 it was 2·9 per cent. The 319 unsatisfactory milk samples examined during the year included, in addition to milks deficient in fat or containing extraneous water, three samples found to contain foreign matter and one hundred and fifty samples found to contain small amounts of penicillin or other antibiotic. Milk adulteration in the County of Lancaster has, in general, shown consistent and appreciable decreases since the year 1946. It is reasonable to assume that these decreases are in some measure due to the increased sampling which has occurred since that year.

The adulteration rate for samples other than milk was 6·9 per cent. which is 0·2 per cent. higher than that obtained in the year 1963 when the figure was 6·7 per cent. The adulteration rate for the last 10 years has varied from 3·8 to 7·4 per cent., the former figure in the years 1952 and 1953 and the latter in the year 1961. The commodities which showed a relatively high proportion of unsatisfactory samples and, therefore, contributed especially to the adulteration rate included sausages (particularly sausages containing permitted preservative without declaration), samples of bread and other foods containing extraneous matter or insects and samples whose labels did not conform to the requirements of the Labelling of Food Order. An examination, however, of Table 21 and the sections of the report concerned with the commodities just mentioned will bring to light the fact that many of the samples reported as unsatisfactory showed only slight irregularities in composition or minor infringements of labelling requirements.

A number of new regulations affecting the composition and labelling of foods and drugs were made during the year under review and of the nine referred to in Part I of this report probably the most important are :—the Meat (Treatment) Regulations, 1964, which prohibit the sale of raw and unprocessed meat containing nicotinic acid or certain other chemicals ; the Soft Drinks Regulations, 1964, which replace previous regulations and which, in addition to other amendments, increase the proportion of sugar and decrease the proportion of saccharin in soft drinks ; the Dried Milk Regulations, 1964, which replace previous regulations and which follow the recommendations for dried milk of the Food and Agriculture Organisation of the United Nations, (standards are now laid down for six descriptions of dried milk); the Mineral Hydrocarbons in Food Regulations, 1964, which replace the previous Mineral Oil in Food Orders and Regulations, (of the amendments introduced probably the most notable is that the maximum permitted level of 12·5 per cent. of microcrystalline wax in chewing compounds has been increased to allow up to 60 per cent. of paraffin or microcrystalline wax in these compounds). An Addendum to the 1963 Edition of the

British Pharmacopoeia was also published in December, 1964, and this contains 60 new monographs on substances or medicinal preparations. In addition to actual regulations the Minister of Agriculture, Fisheries and Food and the Minister of Health circulated during the year 1964 three proposals for regulations relating to canned meat, meat pies and an amendment of the Skimmed Milk with Non-Milk Fat Regulations, 1960. Two reports of the Food Standards Committee were published, one reviewed the Colouring Matter in Food Regulations, 1957, and the other was concerned with food labelling and is the first of two reports reviewing the Labelling of Food Order, 1953, the second will deal with advertisements and claims on labels. Finally, it should be mentioned that of three press notices published during the year 1964, one was concerned with the question of the leaching of chemicals from food containers, etc., another stated that the Preservatives in Food Regulations, 1962, are to be reviewed and the third referred to the tenderising of meat by the pre-slaughter injection of papain.

In Part I of the report will also be found information with regard to the presumptive standards of quality for milk, the special standard for the milk fat content of Channel Islands milk, the proportions of the various special designation milks which were found to be adulterated, the proportion of milks which were found to be naturally poor in solids-not-fat, etc. Although the proportion of Channel Islands milk samples to samples of ordinary milk obtained in Lancashire is low compared to this proportion in counties in the South of England, nevertheless, the number of Channel Islands milk samples submitted to the County Laboratory is slowly increasing. During the year under review the number examined was 476 (364 County) and it is interesting to compare the averages for fat and solids-not-fat of the Channel Islands milk samples with the same averages for ordinary milk samples. Channel Islands milks showed an average of 4·76 per cent. milk fat and 9·03 per cent. solids-not-fat whereas the averages for ordinary milks were 3·70 per cent. for milk fat and 8·60 per cent. for solids-not-fat.

During the year, 77 samples (41 County) were found to contravene the requirements of the Labelling of Food Order. The majority of these, as will be seen from the details given in table 21, were due to a failure to comply fully with the requirements of the order but a number of the more interesting samples are described in the section of the report which deals with this order. A sample labelled culinary cochineal colouring was found to be a solution of the food permitted coal tar colour Amaranth, whereas, genuine cochineal is a substance found in nature. Three samples of canned foods entirely unlabelled were submitted. These had been purchased as bargain offers at supermarkets but such sales of unlabelled canned commodities are contrary to the requirements of the Labelling of Food Order. Of three cans of corned beef of one make submitted, two were found to consist of liver paté. This latter commodity is, of course, much dearer than corned beef and there had obviously been a mistake in labelling by the packers. Objection was taken to the manner in which an imported mayonnaise was labelled in relation to its cream content. Objection was also taken with regard to the use of a trade name for a chemical additive in a list of ingedients instead of giving its specific name. A sample of canned fruit juice was labelled with its Vitamin C content stated in terms of milligrams in the whole contents of the can whereas the Labelling of Food Order requires this to be in terms of milligrams of Vitamin C in each ounce or fluid ounce of the contents. Two samples of sauce of the same make were found to contain sulphite preservative without its presence being declared on the label. Furthermore, the sulphite content was in excess of the amount permitted under the Preservatives in Food Regulations, 1962. A successful prosecution resulted in respect of the excess sulphite content. An account is given of the analysis of three samples of toffee and flour confectionery in regard to which claims of the presence of cream were made. In all three instances only a proportion of the fat present was found to be derived from cream. Objection was taken to the manner in which a can containing a whole chicken was labelled. An account is given of the inadequate labelling of several samples of fruit curd of the " home made " type purchased from market stalls, etc. Finally, objection was taken to the use of the description " Full Strength " in relation to imported chocolate liqueurs which did not actually contain full strength liqueurs.

The average composition of ice-cream, as will be seen from table 22, has been maintained at a satisfactory level but, of the 127 samples examined, seven (all County) were reported upon adversely, six in respect of their fat contents and one in respect of its milk solids other than fat content. Eighteen samples of dairy ice-cream (the fat of which should consist entirely of milk fat) were submitted during the year and four (all County) were reported upon adversely in respect of their milk-fat or milk solids other than fat contents.

A total of 121 samples were submitted during the year 1964 as the result of complaints by members of the public that the samples contained either extraneous matter or insects. Seventy-nine of these samples consisted of County Food and Drugs samples. The corresponding figure for the year 1963 was 124 samples (89 County). There has, therefore, been a slight decrease in this type of sample, a number of which resulted in successful prosecutions. Details will be found in Part VI and the sections of the report dealing with extraneous matter and insects. Probably the most interesting were a mouldy cake which was stated to be a month old ; two samples of bread, one of which contained rodent excrement while the other contained part of the body of a mouse ; a bird dropping found in a bottle of milk ; a carton of rice very heavily infested with meal mites and a Cornish pasty which contained a cockroach and other insects.

During the year under review 4,631 samples of milk have been tested for the presence of antibiotics. This number included 2,531 samples of untreated milk and 2,100 of heat treated milk. One hundred and eighty-five samples (4·0 per cent.) gave positive results of which 182 were due to the presence of penicillin. The highest amount of penicillin found in a sample of untreated milk was 1·0 unit per ml. while the highest amount in heat treated milk was 0·25 unit per ml. A circular letter from the Ministry of Agriculture, Fisheries and Food to Food and Drugs Authorities in August of the year under review drew attention to the fact that some dairies are now testing incoming milks from farms for the presence of antibiotics and that this was to be extended to more dairies as soon as possible. The letter also points out that producers' retail sales will not be covered by any scheme of testing carried out by dairies and suggests that Foods and Drugs Authorities should give particular attention to such sales.

Prosecutions were instituted in respect of 32 County samples during the year under review. Twenty of these related to samples of milk and Channel Islands milk which were deficient in fat or contained extraneous water. Seven related to foods other than milk which were found to contain extraneous matter or insects. The remainder consisted of a sample of gin containing excess water, a sauce containing excess sulphur dioxide, a cut mixed peel deficient in soluble solids, a cake infested with mould and canned shrimps containing benzoic acid preservative.

During the year under review 596 samples of drugs were submitted of which 513 were received from County Sampling Officers. Some 177 of the samples (138 County) consisted of modern official or proprietary drugs of which seven were reported upon adversely. In all 22 of the samples (18 County) were found to be unsatisfactory. Probably the most serious matter was that two samples of the dried herb comfrey were found to contain 27 and 38 per cent. respectively of Belladonna herb. Two samples of penicillin preparations were found to have been incorrectly dispensed. An unusual complaint was received with regard to some saccharin tablets alleged to be discoloured but this was found to be due to coffee extract and had almost certainly been caused by the complainant herself. In Part VI of the report reference is made to an unsatisfactory sample of an eye lotion submitted by an Autonomous Food and Drugs Authority and to the examination of plastic and other toys for the presence of lead and other toxic metals.

The work on radioactivity was continued and is described in Part V of the Report. Ninety-four samples were examined, including air, rain-water, tap-water, school dinners, milk and other foods, primarily in order to obtain further information on fallout and the level of strontium 90 in a mixed diet. We are still receiving fallout from the intensive series of Russian and American nuclear tests carried out in the years 1961 and 1962. The total beta activity in air and rain-water has decreased considerably due to the decay of relatively short lived isotopes but the activity of strontium 90 is still approximately two-thirds of the record high level averages found in corresponding samples during the year 1963. The average strontium 90 activity found in milk during 1964, viz., 24·8 units, was, in fact, very slightly higher than the average of 24·0 found in the year 1963. This is because dairy herds during the early months of the year 1964 were feeding on stored produce harvested after it had been affected by the high level of fallout during 1963, while in the corresponding early months of the year 1963 herds were feeding on stored foods which had been harvested before being greatly affected by the 1962 tests. The first Chinese nuclear test took place on the 16th October, 1964, and fallout from this was detected late in October and in November. From a determination of strontium 89 it was possible to show that the Chinese test was responsible for only one per cent. of the strontium 90 activity of air samples taken over the last three months of the year 1964.

I wish to take this opportunity of expressing my appreciation of the loyal and efficient manner in which the staff of the County Laboratory, both analytical and clerical, have carried out their various duties. The ready co-operation which I have received from the Sampling Officers, both of the County and of the Autonomous Food and Drugs Authorities, has greatly facilitated the smooth running of the laboratory and has thereby enabled the work described in this report to be successfully carried out.

In conclusion I wish to tender to the members of the County Council and to the County Medical Officer of Health my most grateful thanks for their continued encouragement and support and for the interest shown in the work of the County Laboratory.

I have the honour to be, Mr. Chairman, Ladies and Gentlemen,
Your obedient Servant,
GEO. H. WALKER,
County Analyst.

The County Laboratory,
County Hall,
Preston.
2nd July, 1965.

TOTAL SAMPLES EXAMINED

During the year 1964, a total of 12,659 analyses and tests have been carried out in the County Laboratory. They are classified in the following table :—

Table 1

County Samples—		
Food and Drugs Act (including 4,268 milks)		7,766
Appeal-to-Cow		15
Fertilisers and Feeding Stuffs Act, 1926		51
Food and Drugs Act samples (including three Appeals-to-Cow) from the following autonomous Food and Drugs Authorities—		
County Borough of Barrow-in-Furness	177	
Borough of Chorley	109	
Borough of Darwen	99	
Urban District of Huyton-with-Roby	283	
Urban District of Kirkby	137	
City of Lancaster	106	
Borough of Leigh	102	
Borough of Middleton	129	
Borough of Morecambe and Heysham	207	
Urban District of Newton-le-Willows	82	
County Borough of Preston	447	
County Borough of Southport	263	
County of Westmorland	144	
		2,285
Fertilisers and Feeding Stuffs Act, 1926—		
County Borough of Preston		7
County Borough of Southport		10
County of Westmorland		17
Other Samples (from all sources including the County)—		
Potable Waters		145
Other Waters and Effluents		48
Miscellaneous		356
Milk Samples.—Phosphatase Tests		844
Milk Samples.—Methylene Blue Tests		858
Milk Samples.—Turbidity Tests		257
Total number examined		12,659*

*Ninety four of these samples were examined for radioactivity.

The total number of samples analysed in the year is compared, with the total numbers similarly classified for the previous years 1912-1963, in table 2. It will be seen from the table that, since the year 1912, the grand total of samples examined amounts to 391,471.

Table 2

Total number of Samples examined during the years 1912-1964.

Year	County Food and Drugs	Other Authorities Food and Drugs	County Appeal-to-cow Samples	Other Authorities Appeal-to-cow Samples	Fertilisers and Feeding Stuffs Act	Waters and Effluents	Miscellaneous and Departmental	Total Phosphatase, Methylene Blue and Turbidity Tests	Total
1912–1952	202423	9488	2454	116	1034	2926	3602	8548	230591
1953	8635	1345	50	11	59	112	237	1797	12246
1954	8089	1612	67	3	62	84	250	1949	12116
1955	8373	1983	49	5	76	118	288	2463	13355
1956	8215	2177	27	11	59	120	328	2508	13445
1957	8239	2007	77	2	80	121	387	2499	13412
1958	8225	2110	55	5	86	95	414	2445	13435
1959	8256	2394	18	3	87	129	445	2487	13819
1960	7857	2326	12	40	70	134	409	2610	13458
1961	8352	2270	21	36	78	158	449	3130	14494
1962	8784	2331	22	2	87	173	364	3083	14846
1963	8243	2017	12	14	86	187	353	2683	13595
1964	7766	2282	15	3	85	193	356	1959	12659
1912–1964	301457	34342	2879	251	1949	4550	7882	38161	391471

PART I.—SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACT, 1955.

New Food and Drugs Legislation and Proposals for Regulations, etc., During 1964.

During the year under review the following new Regulations, which have a bearing on the work of the Public Analyst, were made :—

The Meat (Treatment) Regulations, 1964.
The Soft Drinks Regulations, 1964.
The Dried Milk Regulations, 1964.
The Mineral Hydrocarbons in Food Regulations, 1964.
The Milk (Great Britain) (Amendment No. 2) Order, 1964.
The Therapeutic Substances (Preservation of Raw Fish) Regulations, 1964.

In addition, three Weights and Measures regulations were made which are of interest, these are as follows :—

The Weights and Measures (Equivalents for Dealings with Drugs) Regulations, 1964 and Amendment Regulations, 1964.

The Weights and Measures (Abbreviations of Units of Measurement) Regulations, 1964.

The Weights and Measures (Marking) Regulations, 1964.

The first Weights and Measures Regulations referred to contain a table of grains and metric equivalents applicable to dealings in drugs and requiring dealings in certain drugs, which are the subject of monographs in the 1963 editions of the British Pharmacopoeia and British Pharmaceutical Codex, to be carried out in terms of the metric equivalent. The remaining two Weights and Measures Regulations replace, in so far as they relate to food, the corresponding provisions of the Pre-packed Food (Weights and Measures : Marking) Regulations, 1957. One of these regulations lays down the precise form of the abbreviations permitted in regard to both the Imperial and Metric systems of measurement, while the other prescribes how indications of quantity are to be marked on containers and includes requirements as to the minimum height of the characters used.

The Meat (Treatment) Regulations, 1964, were made on the 10th January, 1964, and came into operation on the 23rd January, 1964. They followed reports during 1963 of people showing symptoms of nicotinic acid poisoning due to the excessive dusting of raw meat with freshening powders containing nicotinic acid and other chemicals. These chemicals have the property of keeping the surface of meat bright red and fresh looking and will even restore the colour of meat which has become dark in appearance. In addition to the possibility of causing symptoms of nicotinic acid poisoning there was, therefore, also the point that purchasers could be misled in thinking that they were buying fresh meat when in actual fact it was stale. The regulations now prohibit the sale of any raw and unprocessed meat which contains any ascorbic acid, erythorbic acid, nicotinic acid or nicotinamide. It should be noted that the regulations only apply to raw and unprocessed meat and it would appear that raw meat in such commodities as sausages is not covered by the regulations.

The Soft Drinks Regulations, 1964, will be fully in operation by the 2nd June, 1965, and they replace the Food Standards (Soft Drinks) Order, 1953, as amended, and the Soft Drinks Regulations, 1963. The last mentioned regulations never actually came into operation. The principal changes brought about by the new regulations are as follows :— The proportion of sugar in soft drinks is substantially increased and the proportion of saccharin or other permitted artificial sweeteners decreased. All soft drinks containing artificial sweetener must bear a declaration on the container of its presence and this also applies to vending machines for soft drinks. The description " drinks made from whole fresh oranges " is no longer used but has been replaced by the name " comminuted citrus drinks " ; this latter is less likely to be misleading and these drinks are now required to contain a specified minimum amount of " potable citrus fruit " instead of, as previously, being required to be made from a minimum quantity of comminuted fresh oranges. Minimum fruit juice contents are laid down in all appropriate cases and the labelling requirements for soft drinks containing citrus juice or citrus fruit specify when the words " squash," " cordial," " crush," or " drink " must be used in conjunction with the name of the appropriate fruit. Where soft drinks do not comply with the requirements of the regulations with regard to fruit juice or potable fruit content the labels must not bear any pictorial device suggestive of fruit or any word suggestive of fruit not represented in the flavouring of the drink ; if any word suggestive of fruit is used in connection with such a drink then it must be accompanied by the suffix " ade " or preceded by the word " flavour." For the first time compositional standards for semi-sweet soft drinks are included in the regulations and labelling requirements are stipulated for these and for low calorie soft drinks and for soft drinks for diabetics. Low calorie soft drinks must also not contain more than 1·5 calories per fluid ounce (7·5 calories per fluid ounce if for consumption after dilution) and diabetic drinks must not contain any added sugar. There is no restriction on the proportion of artificial sweeteners which diabetic drinks may contain. The artificial sweeteners now permitted in soft drinks are saccharin and its calcium and sodium derivatives and cyclamic acid and its calcium and sodium salts. Definitions and specifications in respect of the permitted artificial sweeteners are given in Schedule I of the regulations. In addition to the requirement already mentioned that on the front of vending machines for soft drinks there must be a declaration of artificial sweeteners, if present, in the drink, vending machines are also required to bear, when applicable, the specified description laid down for the soft drink offered for sale, otherwise the descriptive name of the soft drink must be given. Finally, it should be mentioned that the regulations prescribe requirements as to the size and colour of all declarations required on containers or vending machines.

The Dried Milk Regulations, 1964*, were to come into operation on the 11th March, 1965, and they replaced the Public Health (Dried Milk) Regulations, 1923 to 1948. They also, in general, followed the recommendations for dried milk of the Food and Agriculture Organisation of the United Nations. There are now the following six descriptions of dried milk :—dried full cream milk with not less than 26 per cent. milk fat ; dried three-quarter cream milk with milk fat less than 26 and more than 17 per cent ; dried half-cream milk with milk fat not more than 17 and not less than 14 per cent. ; dried quarter cream milk, with less than 14 and not less than 8 per cent. milk fat ; dried partly skimmed milk, with less than 8 and not less than 1·5 per cent. milk fat; and dried skimmed milk (or dried low-fat skimmed milk), with less than 1·5 per cent. milk fat. All descriptions of dried milk are required to contain not more than 5·0 per cent. of moisture. Precise labelling requirements for all descriptions of dried milk are included in the Regulations. The label on full cream dried milk besides having this description must also declare the equivalent in pints of milk. Similarly all other descriptions, except dried skimmed milk, must bear the appropriate name, the equivalent in pints of the appropriate description of milk and a declaration that it should not be used for babies except under medical advice. Dried skimmed milk besides its name must bear on the label the percentage milk fat content, the equivalent number of pints of skimmed milk and a statement that it is unfit for babies. With the exception of sodium bicarbonate and sodium citrate all additions to the dried milk must be specifically declared in the appropriate place on the label. In addition, the words " sweetened " must be used when only sugar has been added, " modified " where only a constituent of milk has been added and " compounded " when both the above or other ingredients have been added. The addition of milk other than cow's milk must also be declared. The declaration of the equivalent pints of milk may be omitted if the gross weight of the container is over 10 lbs. and the regulations do not apply to the dried milk in powders containing less than 70 per cent. of dried milk.

The Mineral Hydrocarbons in Food Regulations, 1964, replace the Mineral Oil in Food Orders and Regulations, 1949 to 1955. The new regulations came into operation on the 15th August, 1964, but the sale of food containing mineral oil in compliance with the 1949 Order (as amended) was permitted until the 15th February, 1965. The regulations prohibit the use in the composition of food of mineral hydrocarbons, and prohibit the sale of such food, subject to certain specified exemptions. Mineral hydrocarbon is defined in the regulations and includes liquid paraffins, white oils, petroleum jellies, hard paraffins and microcrystalline wax. Any mineral hydrocarbon permitted under any of the exemp-

*Now replaced by the Dried Milk Regulations, 1965, which also apply from the 11th March, 1965. The 1965 Regulations contain similar provisions to those described above except that containers of "dried low-fat skimmed milk" must state the maximum milk fat content present while containers of "dried skimmed milk" are permitted to declare this figure.

tions must comply with the appropriate specification for purity given in Schedule I of the regulations ; in addition, any paraffin or microcrystalline wax used in chewing compounds must have complied with the test for the presence of polycyclic hydrocarbons as described in the same Schedule. In addition to the exemptions permitted under the previous regulations (i.e. a maximum of 0·2 per cent. mineral oil due to contact of the food during preparation with a lubricated or greased surface ; a maximum of 0·5 per cent. mineral oil in dried fruit and 0·1 per cent. on citrus fruit) the following additional exemptions are now permitted :—mineral hydrocarbon in " sealed " eggs due to preserving by dipping, etc., in mineral hydrocarbon ; mineral hydrocarbon in the rind of whole pressed cheese ; a maximum of 0·2 per cent. mineral hydrocarbon in sugar confectionery due to its use as a polishing or glazing agent and the previous exemption of not more than 12·5 per cent. of microcrystalline wax in chewing compounds has now been amended to permit not more than 60 per cent. of paraffin or microcrystalline wax in these compounds. The test for polycyclic hydrocarbons already referred to requires 100 grammes of the paraffin or microcrystalline wax for one determination; in view of the quantity of sample required to carry out the test satisfactorily it is suggested in Circular FSH 14/64, which accompanied the new regulations, that it might be more practicable to take samples, for this test and for tests for purity, at the point of manufacture of the compound rather than at the point of retail sale.

The Milk (Great Britain) (Amendment No. 2) Order, 1964, came into operation on the 1st October, 1964, which was the date given in the Milk (Special Designation) Regulations, 1963, when the new special designation "Untreated" was to replace the special designation "Tuberculin Tested." The 1964 Order referred to above prescribes maximum prices for Untreated Milk, Untreated Milk Farm Bottled and for Channel Islands Untreated Milk Farm Bottled.

The Therapeutic Substances (Preservation of Raw Fish) Regulations, 1964, came into operation on the 1st July, 1964. The regulations exempt, subject to certain conditions, chlortetracycline and oxytetracycline, which are sold or supplied for use in connection with the preservation of raw fish, from the restrictions imposed on their sale by Section 9 (1) of the Therapeutic Substances Act, 1956. Raw fish (but not shell fish) is permitted by the Preservatives in Food Regulations, 1962, to contain not more than 5 parts per million of tetracyclines. The conditions which apply to the sale of tetracyclines for this purpose, in addition to the labelling requirements of the Preservatives in Food Regulations, are, that the preparation shall not contain more than 15 per cent. of tetracycline if intended for use in the making of ice for packing fish, or not more than 25 per cent. if for making a solution in which fish is to be dipped. In addition, the label must also bear approved particulars with regard to storage and use and the date up to which the preparation may be expected to retain its potency.

In addition to the above new legislation, the Minister of Agriculture, Fisheries and Food and the Minister of Health circulated for comment to all interested parties during 1964 Proposals for Regulations for canned meat and for meat pies. Proposals for Regulations to amend the Skimmed Milk with Non-Milk Fat Regulations, 1960, were also circulated for comment. The amendment proposed to the last mentioned Regulations is that the product " S.M.A. " in liquid form shall be exempted from the requirement to be labelled " Unfit for Babies " provided that it conforms to the composition requirements to be included in Part II of the Second Schedule to the Regulations. Certain other products including " S.M.A." in powder form are already exempted from the labelling requirement referred to above.

The Proposals for Regulations for Canned Meat list standards of meat content for five types of products as against 15 types in the Food Standards Report on Canned Meat published in the year 1962. The five types have meat contents ranging from 95 per cent. for canned meat to 65 per cent. for meat loaf. Other meat products may have meat contents down to 25 per cent. provided there is a declaration of the actual meat content in an approved form on the label. The meat content shall be calculated as a percentage by weight of the total content of the can and proposals are made that fat shall only be reckoned as meat up to specified percentages of the total meat content, depending on the type of product. While the proposals are quite enforceable your Analyst regrets that the minimum limit of 35 per cent. meat for a meat product, originally recommended in the 1962 Report, has been reduced to 25 per cent., and the named categories do not include such well known meat products as casserole steak, curried meat, braised meat, hamburgers, canned sausages, etc., This could mean that these canned products could be sold with as little as 25 per cent. meat content and that many present day products with a satisfactory meat content may well tend to decline to this low limit. As already mentioned meat percentages are to be calculated on the whole contents of the can yet no special provision is made for meat products packed in brine or for meat packed " on the bone."

The Proposals for Regulations for meat pies follow, in general, the recommendations of the Food Standards Committee in their report published during the year 1963. Pies, described as meat pies or by the name of the meat, will be required to contain not less than 25 per cent. meat and meat and vegetable pies, including Cornish Pasty, etc., not less than 12½ per cent. of meat. With regard to meat pies there is a proviso that the standard shall be deemed to be complied with if one ounce of meat is present in a pie of not less than 4 ounces and not more than 5½ ounces, and ⅝th of an ounce of meat in a pie of up to 3 ounces. In applying this proviso to pies of 5½ ounces weight the proposals would appear to be unnecessarily lenient ; such a pie containing one ounce of meat would only contain just over 18 per cent. meat. The amount of fat in the pastry of all pies which is in excess of a ratio of fat to carbohydrate of 60 : 100 is to be credited to the meat content. With regard to sampling it is proposed that for enforcement purposes a sample shall consist of at least three pies. It would not be possible to divide a pie satisfactorily and it is not made clear that each portion of a sample shall consist of one or more whole pies. Sampling would appear to be the main weakness in the proposals as it is generally admitted that individual pies even from the same batch do vary in composition so that the three parts of a sample may not be identical in composition. Furthermore, while a formal sample, each of the three portions of which consists of a single pie, could be taken under existing legislation (Section 97 of the Food and Drugs Act) if the pies were prepacked, this would not appear possible in the case of pies sold loose. It is proposed to exempt catering sales from the requirements of the regulations and this could leave the way open for the sale of sub-standard pies in cafes, snack-bars, etc.

Two reports of the Food Standards Committee were published during the year under review. The first reviewed the Colouring Matter in Food Regulations, 1957, and the second was concerned with food labelling.

The Report on Colouring Matters was the result of the work of the Food Additives and Contaminants Sub-Committee of the Food Standards Committee. This Sub-Committee, because of the growing importance of its work in relation to chemical additives in foods, has now been made a Committee in its own right. The chief recommendation made in the report is that the following six coal-tar colours :—Ponceau 3R, Ponceau SX, Napthol Yellow S, Blue V.R.S., Yellow R.F.S. and Yellow RY should be deleted from the present permitted list. The Pharmacology Panel of the Sub-Committee advised that the first four should be deleted in that they present hazards of toxicity or could be be carcinogenic ; the remaining two on the evidence of chemical manufacturers that they are liable to contain subsidiary dyes or not to be constant in composition. The deletion of Blue V.R.S. from the permitted list could create difficulties for food manufacturers in that at present it is the only permitted blue colour. The Pharmacology Panel regard only two coal-tar colours (Amaranth and Green S) as entirely satisfying all safety criteria out of the 30 at present permitted and they recommend that the evidence with regard to the others be again reviewed within five years. Other recommendations are that:—Black 7984 should be provisionally added to the permitted list; two synthetic carotenoids should be permitted ; titanium dioxide, in future, should be restricted to the surface colouring of food ; copper derivatives of chlorophyll should not be permitted because of their possible effect on the Vitamin C content of food and for other reasons and that the colouring of citrus fruit should be prohibited.

The Report on Food Labelling reviews the provisions of the Labelling of Food Order, 1953, as amended, and, in general, it recommends stricter requirements for food labelling. The report is the first of two to be published ; the second will deal with all types of claims made with regard to foods either on labels or in advertisements. A Press Notice was published during October of the year under review stating that the Food Standards Committee was considering the question of claims of all types and that evidence should be submitted by interested organisations. The report published during 1964 is very comprehensive and deals with all aspects of food labelling other than claims. It makes some 72 recommendations which if adopted will go far to remove many anomolies brought to light during the operation of previous labelling regulations. The long list of exemptions from all or part of the labelling requirements of the 1953 Order is to be drastically curtailed and liquid cow's milk will be the only food wholly exempt in future. Where foods are exempt from declaring a list of ingredients, selective declaration of one or two ingredients will not be permitted ; any voluntary list will be required to be complete and in the correct form. Other recommendations of special interest are that :—deodorised fatty oils should carry a declaration indicating whether they are of animal or vegetable origin ; additions used as manufacturing aids should be declared in the list of ingredients but additions such as preservatives, colours, artificial sweeteners, etc., should be specially declared ; the addition of meat tenderisers should be declared ; the declaration of alcohol content in intoxicating liquors should be in terms of percentage of alcohol by volume and not per cent. proof spirit or °Proof ; the word " vintage " should not be applied to cider ; liquid glucose should always be called " glucose syrup " when it is necessary to declare it on labels ; the minimum meat content of meat paste (55 per cent.) should be increased to the minimum fish content (70 per cent.) of fish paste ; certain fresh non-prepacked foods i.e. fish, fruit, cheese, potatoes, etc., where the variety is of importance to the purchaser, should be labelled with this information and a registered trade mark should no longer be permitted on the label instead of the name and address of the packer.

There are many other recommendations but the following two are specially commented on by your Analyst. It is recommended that the name or description applied to a food should be in letters of uniform size and colour. This follows the normal practice recommended as far back as the Ministry of Food's Report on the Advertising, Labelling and Composition of Food published in 1949, and as recently as March of the year under review in the Proposals for Regulations for Canned Meat. However, this is deviated from in the next paragraph of the report which states that where a name or description is rather extended the major part may be in type up to one-third larger than the minor part. While this is only a limited relaxation of former recommendations it is to be regretted since it could be a first step in the whittling away of a very desirable principle in food labelling. The other recommendation concerns the labelling of fish paste. At present, fish paste containing only the named fish is described as "X paste," while paste containing other fish besides the named fish is described as " fish paste X." The report quite rightly points out that customers are confused by this differentiation and recommends that in future the former type should be called " X Spread " and the latter type " X Paste." This would appear in your Analyst's opinion to be even more confusing than the descriptions at present in use and he feels that the mixed fish product should be clearly marked " X paste with other fish."

In addition to the Press Notice already referred to, which stated that the Food Standards Committee was considering claims on labels and advertisements, three other important Press Notices were published during the year under review. One states that the Food Additives and Contaminents Committee is examining the question of the leaching of chemicals from food containers, packing materials and printing inks to food. Another states that the same Committee is to review the Preservatives in Food Regulations, 1962. The remaining Press Notice was concerned with meat tenderisers and states that the Food Standards Committee see no hazard to human health from the comsumption of meat tenderised by the pre-slaughter injection of papain. The Committee also considers that provided meat so treated is labelled the practice is unobjectionable. This recommendation with regard to labelling has been followed in the Report on Food Labelling referred to above.

Although the 1963 Edition of the British Pharmacopoeia only became official on the 1st January, 1964, it was found necessary to publish an Addendum in December, 1964, which became official on the 1st June 1965, because of recent advances in medical and pharmaceutical practice. The Addendum includes 60 new monographs on substances or medicinal preparations. There are no deletions but 52 of the monographs in the 1963 Pharmacopoeia are amended. The additions include several antibiotics, five radioactive materials and three derivatives of chloral hydrate. The sulphonamide sulphapyridine which was deleted from the Pharmacopoeia in 1948 is now restored because of its recently established use for a particular skin condition. In addition to thrapeutic agents there are monographs on cyclamic acid and its calcium and sodium salts used as sweetening agents in pharmaceutical preparations and on butylated hydroxyanisole, butylated hydroxytoluene, dodecyl gallate and octyl gallate which are used as antioxidants. It is rather surprising to find a monograph on butylated hydroxytoluene included with the additions because when the Food Standards Committee published its report in October 1963 on the review of the Antioxidants in Food Regulations, 1958, it recommended that the use of butylated hydroxytoluene should be discontinued because it might constitute a possible hazard to health.

Particulars of Samples of Food and Drugs submitted by County Sampling Officers

In table 3 there is a list of all the articles of food and drugs which were submitted during the year 1964 from the County of Lancaster together with the number of each kind and also the number found to be adulterated.

Table 3

Samples examined under the Food and Drugs Act during 1964

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Almonds, Ground		6	2	8			1	1
Almond Oil		13		13				
Apple Sauce, Canned ...		3		3				
Arrowroot		13		13				
Asprin Tablets		9		9		1		1
Baby Food		6		6		2		2
Bacon		24		24				
Baking Powder		27	3	30				
Barley		23	1	24		3		3
Barley Kernels		2		2				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Beans, Curried with Sultanas, Canned		1		1				
Beans with Pork Sausages, Canned		1		1				
Beef Stock, Concentrated, Tablets		2		2				
Beer		6		6				
Biscuits		17	1	18		1		1
Black Puddings		2		2				
Blancmange Powder		12	2	14				
Borax		15		15		1		1
Boric Acid		9		9				
Boric Acid Ointment... ...		14		14				
Brandy	10			10				
Bread		28	1	29		14		14
Bread, Brown		6		6		1		1
Bread, Starch Reduced ...		1		1				
Butter		48		48		3		3
Butter Pie		1		1		1		1
Cake Decorations, Edible ...		11	1	12		1		1
Cake Coating		2		2				
Cake Mixture, Sweetened ...		5		5				
Calf's Foot Jelly		1		1				
Camphorated Oil		28		28		2		2
Cascara Tablets		1		1				
Castor Oil		15		15				
Cayenne Pepper, Ground ...		1		1				
Cereal, Breakfast		3	2	5		1		1
Cheese		18	1	19				
Cheese Spread		16		16				
Cheese and Onion Pie ...		2		2		2		2
Chewing Gum		2		2				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Chicken, Minced in Jelly (Bottled and Canned) ...		9		9		1		1
Chicken, Curried, with Mushrooms, Canned ...		1		1				
Chicken Spread		3		3				
Chocolate, Drinking		3		3				
Christmas Tree Decorations, Edible		13		13		1		1
Chutney		8		8				
Cinnamon, Ground		2		2				
Cocoa		21		21				
Coconut, Desiccated		5	1	6		1		1
Coconut, Sweetened		1		1				
Codeine Tablets, Compound		3		3				
Cod Liver Oil		8		8				
Coffee		30	2	32				
Coffee Extract, Dry		16		16				
Coffee Extract, Dry, Vitaminised		1		1				
Coffee and Chicory		1		1				
Coffee and Chicory Essence Liquid, Sweetened		6		6				
Colouring Materials		1	1	2			1	1
Comfrey		3		3		2		2
Condiment, Non-brewed ...		1		1				
Cooking Fat		18	4	22				
Cooking Oil		7		7		1		1
Cornflour		13	3	16				
Cough Medicine		28		28		2		2
Cough Sweets		4		4				
Cream, Sterilised		24		24				
Cream, Single		3		3				
Cream, Double		12		12				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Cream, Soured, Cultured		1		1				
Cream of Tartar		6		6				
Croutons		1		1				
Curry Powder		4		4				
Custard Powder		19	4	23				
Dairy Produce " Best of the Milk " (Canned)		2		2				
Dairy Set (Vanilla Blancmange)		1		1				
Dessert Powder		1		1		1		1
Dripping		13		13		1		1
Epsom Salts		21		21				
Figs, Compound Syrup of		1		1				
Fish, Bottled		2		2				
Fish Cakes		1		1				
Fish, Canned	1	75	6	82	1	4		5
Fish Dressing		4		4				
Fish Paste		19		19				
Flavouring Materials		9		9				
Flour		25	3	28		6		6
Flour, Self-raising		41	1	42				
Flour Confectionery (Jam Tarts, etc.)		58		58		5		5
Food, Canned (sold as " Mystery Meal ")		2		2		2		2
Fruit, Bottled		1		1				
Fruit, Canned		58	2	60		6		6
Fruit, Dried	1	84	13	98	1	3		4
Fruit Curd		14	1	15				
Fruit, Fresh (Oranges, Apples, etc.)		60		60		1		1
Fruit Juice, Bottled		3		3				
Fruit Juice, Canned		4		4		1		1

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Fruit in Jelly		1		1				
Fruit Malt Loaf		1		1				
Fruit Pie Filling, Canned ...		2		2				
Gelatine		3		3				
Gin	16			16	1			1
Ginger Concentrate		1		1				
Ginger, Ground		7		7				
Glauber's Salt		1		1				
Glucose with Vitamin D ...		3		3				
Glycerin		25		25		1		1
Golden Raising Powder ...		11		11		2		2
Goose, Boned, in Natural Jelly, Canned		1		1				
Gravy Browning		30		30		6		6
Gravy Powder		3	1	4				
Gravy Salt		2		2				
Halibut Oil Capsules ...		1		1				
Headache Tablets		3		3				
Health Salts		2		2				
Herbs, Dried, Culinary ...		5	2	7				
Honey		14		14				
Horseradish Sauce		4		4				
Ice-Cream		66		66		7		7
Ice-Cream, Dairy		13		13		4		4
Ice-Cream, Cold Mix ...		1		1				
Ice Lollies		15		15		1		1
Ice Lolly Mix		1		1				
Ice Lolly Syrup		1		1		1		1
Indian Brandee		1		1				
Indigestion Tablets		1		1				
Invalid Food		2		2				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Iodine, Tincture of		22		22		1		1
Iron Brew		1		1				
Jam		19	5	24				
Jelly, Table		34	4	38				
Lard		47	2	49		2		2
Laxative Chewing Gum ...		1		1				
Macaroni		1		1				
Mace, Ground		1		1				
Malt Extract with Cod Liver Oil		2		2				
Malt, Milk & Cocoa Beverage		6		6		1		1
Margarine		41	7	48		1		1
Marmalade		24	2	26				
Marzipan		13		13		1		1
Meal, portion of		1		1		1		1
Meat Balls in Tomato Sauce, Canned		1		1				
Meat, Canned		48	1	49		9		9
Meat, Cooked		3		3		1		1
Meat, Fresh			1	1				
Meat, Frozen		1		1				
Meat Extract Compound ...		1		1				
Meat Paste		21		21				
Meat Pasties		1		1				
Meat Pies		5		5		2		2
Meat & Potato Pies ...		2		2		2		2
Meat, Potted		8		8				
Meat Pudding, Canned ...		6		6				
Meat Tenderiser		1		1				
Meat & Vegetables, Canned ...		6		6		1		1
Milk	2240	1779	249	4268	160	142	17	319
Milk, Channel Islands ...	218	146		364	32	10		42

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Milk, Condensed, Full Cream Unsweetened		19		19		1		1
Milk, Condensed, Skimmed, Sweetened		9		9				
Milk, Condensed, Special Full Cream, Sweetened ...		3		3				
Milk, Dried, Full Cream ...		1	5	6				
Milk, Dried, Skimmed ...			2	2				
Milk, Dried, Modified ...		3		3				
Milk, Malted		4		4				
Milk, Skimmed, with non-milk Fat, Canned		1		1		1		1
Milk, Skimmed, with non-milk Fat, Powder		1		1				
Milk Shake Syrup		1		1				
Mincemeat		30		30		1		1
Mint Jelly		1		1				
Mint Sauce		2	1	3				
Mustard, Compound ...		12	1	13				
Mustard, Liquid		1		1				
Mustard Paste		12		12				
Non-alcoholic Beverage ...		1		1				
Nutmeg, Ground		2		2				
Nuts		3		3				
Oatcakes		1		1				
Oatmeal		11	1	12				
Oats			1	1				
Olive Oil		40		40				
Olives, Stuffed		3		3				
Pancake and Yorkshire Pudding Mixture		2	1	3				
Paprika		1		1				
Paraffin, Liquid		15		15				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Pastry Mix		2		2				
Peanut Butter		2		2				
Penicillin Tablets, Lozenges and Capsules		14		14		1		1
Pepper, Black		3		3				
Pepper, White		30	1	31				
Pepper Corns		1		1				
Pickles		33		33		2		2
Pie Filling		4	1	5				
Pie Filling, Canned		2		2				
Potato Crisps		8		8				
Potato Puffs		1		1				
Prawns		1		1				
Proprietary Medicines : ...								
Actal Tablets		4		4				
Agarol		4		4				
Aludrox		4		4				
Asmapax Tablets		2		2				
Avomine Tablets		3		3				
Carbrital Capsules		2		2				
Chloromycetin Palmitate Suspension		2		2				
Dequadin Lozenges ...		5		5				
Dexedrine Tablets		2		2				
Ethnine Linctus		4		4				
Fentazin Tablets		2		2				
Ferraplex ' B ' Tablets ...		3		3				
Ferrodic Tablets		5		5				
Fersamal Tablets		2		2				
Gelusil Tablets		2		2				
Hydro Saluric ' K ' Tablets		2		2				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Icipen V Tablets		4		4				
Lobak Tablets		4		4				
Metatone		3		3				
Multivite Pellets		5		5				
Nardil Tablets		2		2				
Nembutal Capsules ...		2		2				
Panadol Tablets		3		3				
Paynocil Tablets		3		3				
Penicillin V Suspension ...		2		2		1		1
Phenergan Tablets ...		2		2				
Prodexin Tablets		4		4				
Seconal Sodium Capsules ...		2		2				
Selsun Suspension ...		5		5				
Soneryl Tablets		2		2				
Sparine Tablets		2		2				
Stelazine Tablets		2		2				
Stemetil Tablets		2		2				
Sulphatriad Suspension ...		2		2				
Sulphonamide Suspension...		4		4		2		2
Travel Sickness Tablets ...		3		3		1		1
Tuenal Pulvules		2		2				
Tyrozets		3		3				
Veganin Tablets		5		5				
Pudding, Canned		10		10		1		1
Pudding, Christmas, etc. ...		35	1	36		4		4
Pudding, Rice, Canned ...		2		2				
Pudding, Sponge		2		2				
Pudding, Mixture, Unsweetened		5		5				
Radio Malt		1		1				
Rennet, Essence of		3		3				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Rice		24	9	33		3	3	6
Rice, Ground		3	2	5				
Rum	15			15				
Saccharin Tablets		2		2				
Sago		8	2	10				
Salad Cream and Salad Dressing		16		16		1		1
Salad Oil		1		1				
Salt		6	1	7				
Sandwich { portion of ham and tongue sandwich... ...		1		1		1		1
Sauce	1	37		38	1	1		2
Sauce Powder		4		4				
Sausages, Beef		31		31		7		7
Sausages, Pork		28		28		14		14
Sausages, Canned		4		4		1		1
Sausages, Cooked		1		1		1		1
Sausage Meat		1		1				
Sausage Roll		3		3		1		1
Seasoning		1		1				
Seasoning, Compound ...		1		1				
Seasoning, Liquid		1		1				
Sedative Tablets		1		1				
Seidlitz Powders		9		9				
Seidlitz Powders, double strength		1		1		1		1
Seidlitz Powders, extra strong		1		1		1		1
Semolina		16	2	18		1		1
Shandy, Canned		3		3				
Sherbet		2		2				
Shrimps		4		4				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Shrimp Salad (jar)		1		1		1		1
Snack Meal, Canned		2		2				
Sodium Bicarbonate ...		18		18				
Soft Drinks, to be diluted ...		30		30				
Mineral Waters...		15		15		5		5
Orange Drink ...		1		1		1		1
Canned		7		7				
Soft Drink, Powder		1		1				
Soft Drink, Tablets		1		1				
Soup, Canned		7		7		2		2
Soup, Mixture, Dry		12		12		4		4
Soup, Powder		2		2				
Spaghetti Sauce Seasoning with Mushrooms		1		1				
Spice, Mixed, Ground ...		5		5				
Spice, Pickling		1		1				
Spread (two Honey, three Sandwich)		5		5				
Stout		3		3				
Suet Dumpling Mixture ...		1		1				
Suet Shredded		14	2	16		2		2
Sugar		26	5	31				
Sugar, Brown		9		9		1		1
Sugar, Demerara		6		6				
Sugar, Icing		2	2	4				
Sulphur Tablets		2		2				
Sweets (including chocolates and sweets containing butter)	1	55	1	57	1	1		2
Sweetmeats		3		3				
Syrup		11		11				
Tapioca		24	1	25				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Tea		53	5	58				
Tea Bags		1		1				
Teething Powders		17		17				
Throat Lozenges		1		1				
Tomatoes, Canned		9		9		1		1
Tomatoes, Fresh		18		18		1		1
Tomato Juice, Bottled and Canned		4		4				
Tomato Piquant		2		2				
Tomato Puree, Canned ...		2		2		2		2
Treacle and Molasses		13		13				
Trifle		1		1		1		1
Trifle Pack		2		2				
Turkey, Minced, Bottled ...		3		3				
Vegetables, Cooked		1		1				
Vegetables, Canned		11		11				
Vegetables, Dehydrated ...		3		3				
Vegetables, Dried		62	6	68		2	1	3
Vegetables, Fresh		18		18				
Vegetables, Frozen		1		1		1		1
Vegetable Juice, Canned ...		1		1				
Vinegar		35	1	36				
Vitamin Tablets		2		2				
Vodka	2			2				
Walnuts, Pickled		3		3				
Whisky	23			23				
Wine (British Sherry, British Ruby, etc.) ...		10		10				
Yeast		1		1				
Yoghourt		1		1		1		1
Zinc and Castor Oil Cream, B.P.		2		2				

Table 3—continued

Samples	Number examined				Number adulterated or otherwise giving rise to irregularity			
	Formal	Informal	Private	Total	Formal	Informal	Private	Total
Zinc Ointment		17		17		1		1
Totals	2528	4855	383	7766	197	342	23	562

The Number of Commodities

The variety of commodities on sale is now very large, and this is reflected in the number of different articles of which samples have been taken and submitted for analysis. Three hundred and twenty six different commodities consisting of food and drugs were examined during the year.

In order to obtain adequate sampling of the common articles of food it is the practice to issue quarterly lists of samples which assist the sampling officers to correlate their samples one with another and at the same time ensure that each area is satisfactorily sampled in respect of any particular commodity. Due to the desirability of allowing considerable latitude in the sampling of other articles where this may be indicated in the public interest, the variety of samples actually examined is considerably increased by the inclusion of commodities in less common demand.

Total Adulteration

During the year under review, 7,766 samples of food and drugs were submitted for examination under the Act, and of these 562 were reported upon adversely ; the total adulteration was, therefore, 7·2 per cent. This is higher than the percentage of adulteration for the previous year (1963) when the figure was 5·8 per cent.

In table 4 the percentages of adulteration are given for the past ten years. It will be seen that during this period the lowest figure is 3·8 which was reached during the year 1962 and that the average figure is 4·9 per cent. In general, the adulteration rate during and immediately subsequent to the war was considerably greater than that found in preceding years. The figure for the year under review is rather high when compared with the figures for the last ten years, and it does not fall within the range of the adulteration rate during the ten years 1929-1938 which preceded the war when the percentage adulteration varied from as little as 2·6 to 4·2. The increase during 1964 is, however, due to increased testing of milks for antibiotics and is not, therefore, directly comparable with figures in previous years.

Table 4

Percentage of Adulteration of County Samples of Food and Drugs, 1955-1964.

Year	Total No. of Samples	No. of Adulterated Samples	Percentage of Adulteration
1955	8,373	413	4·9
1956	8,215	340	4·1
1957	8,239	349	4·2
1958	8,225	405	4·9
1959	8,256	373	4·5
1960	7,857	361	4·6
1961	8,352	414	4·9
1962	8,784	334	3·8
1963	8,243	480	5·8
1964	7,766	562	7·2
1955–1964	82,310	4,031	4·9

Analysis of County Food and Drug Samples

Table 5 gives the percentage of adulteration over the last ten years side by side with the various types of samples and with the number of samples taken per 100,000 of the population. The total number of samples and the number of samples per 100,000 of the population for the year under review have been well maintained at the level reached during the year 1947 (6,819 and 505 respectively) and the figures for all subsequent years are much higher than the corresponding figures for any of the previous years in the history of the County Laboratory.

Table 5

Year	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Percentage of Adulteration ...	4·9	4·1	4·2	4·9	4·5	4·6	4·9	3·8	5·8	7·2
Total Samples ...	8,373	8,215	8,239	8,225	8,256	7,857	8,352	8,784	8,243	7,766
Formal Samples	3,300	3,474	3,331	3,337	3,321	3,012	2,995	3,230	2,686	2,528
Informal Samples	4,744	4,404	4,589	4,568	4,627	4,589	5,025	5,122	5,211	4,855
Private Samples	329	337	319	320	308	256	332	432	346	383
Number of Samples per 100,000 of the population	613	594	588	581	576	548	557	586	539	541

Total Adulteration : the County compared with other areas.

Table 6 gives the percentage of adulteration for the year 1964 for certain other Food and Drugs Authorities whose figures were available at the time of writing. I am indebted to the Public Analysts of the various districts for the information included in this table and also for the figures included in tables 13 and 17. It will be seen that the figure for the County of Lancaster, *viz,* 7·2 per cent. is higher than the average (4·2 per cent.) for the Authorities mentioned. The range of adulteration for the areas included in the table varied from 9·9 to 0·7 per cent.

Table 6

Total Adulteration, 1964. Various Areas.

Area	No. of Samples	Percent. of Adult.	Area	No. of Samples	Percent. of Adult.
Derbyshire, County	2,118	5·4	Bristol	2,982	0·7
Durham, County ...	3,932	1·9	Leeds...	1,741	9·9
Kent, County ...	3,008	7·4	Leicester	2,286	5·1
Somersetshire, County ...	4,199	2·8	Liverpool	3,800	3·6
Staffordshire, County ...	6,378	3·0	Manchester	2,560	1·7
Surrey, County ...	866	4·0	Portsmouth	1,462	4·0
Worcestershire, County ...	6,325	7·6	Salford	791	7·8
Birmingham ...	5,541	1·2	Southampton ...	758	1·0

Adulteration in County Districts, etc.

There were 93 (91 from 1st April) Districts shown in the Area of the County Food and Drugs Authority for the year under review.

Table 7 shows the number of samples taken and the number of adulterated samples in each of the districts together with those relating to 13 autonomous areas. An examination of the table will show that adulteration was nil in two of the County Districts as against nil in six districts for the year 1963. None of the autonomous areas showed a total freedom from adulteration.

Table 7

Adulteration in the County District and in the areas of 13 Autonomous Food and Drugs Authorities during the year, 1964.

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Abram U.D.C.	11	1	12	2	23	3
Adlington U.D.C....	26	2	12	0	38	2
Ashton-in-Makerfield U.D.C. ...	48	0	51	5	99	5
Aspull U.D.C.	18	1	10	0	28	1
Atherton U.D.C.	61	2	40	3	101	5
Audenshaw U.D.C.	22	7	29	4	51	11
Bacup Borough	83	2	47	3	130	5
Barrowford U.D.C.	19	3	13	2	32	5
Billinge and Winstanley U.D.C.	10	0	24	1	34	1
Blackburn R.D.C.	78	1	22	1	100	2
Blackrod U.D.C.	12	2	8	0	20	2
Brierfield U.D.C.	16	0	19	1	35	1
Burnley R.D.C.	75	5	23	0	98	5
Carnforth U.D.C.	15	1	13	0	28	1
Chadderton U.D.C.	65	3	74	3	139	6
Chorley R.D.C.	113	7	57	1	170	8
Church U.D.C.	15	0	15	3	30	3
Clayton-le-Moors U.D.C. ...	17	0	18	3	35	3
Clitheroe Borough	38	2	21	1	59	3
Clitheroe R.D.C.	64	7	19	2	83	9
Colne Borough	56	3	39	3	95	6
Crompton U.D.C....	65	3	43	1	108	4
Dalton-in-Furness U.D.C. ...	40	4	19	2	59	6
Denton U.D.C.	62	7	68	8	130	15
Droylsden U.D.C.	42	1	78	2	120	3
Failsworth U.D.C.	34	3	53	1	87	4
Farnworth Borough	91	5	55	4	146	9
Fleetwood Borough	59	6	72	6	131	12

Table 7—continued

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Formby U.D.C.	8	0	44	1	52	1
Fulwood U.D.C.	48	1	35	6	83	7
Fylde R.D.C.	52	13	33	2	85	15
Garstang R.D.C.	63	9	45	3	108	12
Golborne U.D.C.	31	2	77	0	108	2
Grange U.D.C.	13	0	19	2	32	2
Gt. Harwood U.D.C.	36	4	19	4	55	8
Haslingden Borough	47	4	26	1	73	5
Haydock U.D.C.	21	1	31	2	52	3
Heywood Borough	67	6	59	5	126	11
Hindley U.D.C.	29	0	60	4	89	4
Horwich U.D.C.	27	1	42	4	69	5
Ince-in-Makerfield U.D.C. ...	44	4	38	1	82	5
Irlam U.D.C.	41	1	29	0	70	1
Kearsley U.D.C.	20	1	22	0	42	1
Kirkby U.D.C.	30	2	31	2	61	4
Kirkham U.D.C.	34	2	7	0	41	2
Lancaster R.D.C.	70	7	44	2	114	9
Lees U.D.C.	22	2	15	1	37	3
Leyland U.D.C.	41	2	40	0	81	2
Litherland U.D.C.	56	5	49	4	105	9
Little Lever U.D.C.	25	3	13	1	38	4
Littleborough U.D.C.	52	0	36	6	88	6
Longridge U.D.C.	20	1	15	1	35	2
Lunesdale R.D.C.	40	2	22	3	62	5
Lytham St. Annes Borough ...	88	2	92	4	180	6
Milnrow U.D.C.	43	3	21	3	64	6
Mossley Borough	28	1	24	0	52	1
Nelson Borough	90	7	70	5	160	12
North Lonsdale R.D.C.	152	12	45	2	197	14

Table 7—continued

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Ormskirk U.D.C.	22	4	76	5	98	9
Orrell U.D.C.	15	0	31	1	46	1
Oswaldtwistle U.D.C.	84	3	14	2	98	5
Padiham U.D.C.	34	2	18	3	52	5
Poulton-le-Fylde U.D.C.... ...	34	1	36	2	70	3
Preesall U.D.C.	8	0	13	0	21	0
Prescot U.D.C.	16	1	46	3	62	4
Preston R.D.C.	125	2	115	9	240	11
Prestwich Borough	83	7	65	9	148	16
Radcliffe Borough	71	2	55	7	126	9
Rainford U.D.C.	14	1	11	1	25	2
Ramsbottom U.D.C.	43	6	37	4	80	10
Rawtenstall Borough	72	3	48	5	120	8
Rishton U.D.C.	18	0	9	2	27	2
Royton U.D.C.	64	0	49	1	113	1
Skelmersdale U.D.C.	12	1	17	0	29	1
Standish-with-Langtree U.D.C.	20	2	25	2	45	4
Thornton-Cleveleys U.D.C. ...	50	4	48	2	98	6
Tottington U.D.C.	28	0	13	2	41	2
Trawden U.D.C.	13	0	9	1	22	1
Turton U.D.C.	51	5	32	3	83	8
Tyldesley U.D.C.	42	2	36	3	78	5
Ulverston U.D.C.	38	5	27	3	65	8
Upholland U.D.C.	12	0	25	1	37	1
Urmston U.D.C.	33	4	30	6	63	10
Walton-le-Dale U.D.C. ...	95	12	30	3	125	15
Wardle U.D.C.	18	0	12	0	30	0
Warrington R.D.C.	64	5	87	1	151	6
West Lancashire R.D.C. ...	72	4	157	12	229	16
Westhoughton U.D.C.	60	3	30	4	90	7

Table 7—continued

District	Milk		Other Articles		Total	
	Samples	Adult.	Samples	Adult.	Samples	Adult.
Whiston R.D.C.	57	4	128	6	185	10
Whitefield U.D.C.	27	2	36	3	63	5
Whitworth U.D.C.	37	2	22	3	59	5
Wigan R.D.C.	20	1	26	0	46	1
Withnell U.D.C.	13	0	8	1	21	1
Worsley U.D.C.	33	4	20	2	53	6
Miscellaneous	177	51	0	0	177	51
Total County Districts	4,268	319	3,498	243	7,766	562
Thirteen Autonomous Food and Drugs Authorities	975	93	1,307	130	2,282	223
Total—All Sources	5,243	412	4,805	373	10,048	785

Adulteration of Milk in the County

The number of milks submitted under the Food and Drugs Act during the year was 4,268 and of these 319 were reported against ; the amount of adulteration was, therefore, 7·5 per cent. This figure, as will be seen from table 8 is higher than the average for the last ten years and is in fact, the highest shown in the table. As already mentioned, the increase during the year under review is due to the testing of samples for antibiotics.

Table 8

Percentage of Adulteration of Milk Samples, 1955-1964

Year	No. of Samples	No. of. Adulterated Samples	Percentage of Adulteration
1955	5,637	273	4·8
1956	5,497	203	3·7
1957	5,411	190	3·5
1958	5,385	231	4·3
1959	5,294	198	3·7
1960	5,051	178	3·5
1961	5,201	180	3·5
1962	5,403	156	2·9
1963	4,823	250	5·2
1964	4,268	319	7·5
Total ...	51,970	2,178	4·2

The Adulteration of Milk in the County for each month of the year

In table 9 will be found the figures for the number of milk samples submitted by County Sampling Officers during each month of the year together with the number adulterated and the percentage adulteration. In general the percentage adulteration usually increases during winter and decreases in the autumn. The increasing adulteration of milk noted during the winter and first half of the year may be due to two factors : (*a*) the poorer quality of milk towards the end of the winter enables cases of slight adulteration to be detected more readily and, (*b*) the scarcity of milk in the winter may, in some instances, be an incentive to adulteration. As will be seen from table 10 a high proportion of the adulterated samples contained traces of antibiotics.

Table 9

Milk—Monthly Adulteration, 1964.

Month	Number of Samples	Number Adulterated	Percentage of Adulteration
January	354	55	15·5
February	440	46	10·4
March	298	44	14·8
April	455	50	10·9
May	343	26	7·6
June	342	14	4·1
July	352	6	1·7
August	347	8	2·3
September	355	21	5·9
October	386	16	4·1
November	403	21	5·2
December	193	12	6·2
Total ...	4,268	319	7·5

In the following table will be found particulars of the various types of adulteration and the number of samples under each heading :—

Table 10

			Per cent.
Milks deficient in fat only	71	*or*	1·67
Milks containing added water only	84	*or*	1·98
Milks deficient in fat and containing added water	11	*or*	0·26
Milks deficient in fat and containing Penicillin	1	*or*	0·02
Milks containing Penicillin or other bacteriostat	146	*or*	3·43
Milks containing Penicillin and added water ...	3	*or*	0·07
Milks containing foreign matter, etc.	3	*or*	0·07
Milks containing preservatives...	Nil	*or*	Nil
Milks containg colouring matter	Nil	*or*	Nil
	319		7·50
Milks containing more than 3 per cent, added water	33	*or*	0·78
Milks 10 per cent. or more deficient in fat ...	21	*or*	0·50

Alternatively the milk adulteration can be expressed in terms of the adulteration of the various grades of milk as shown in the following table.

Table 11

Grade of Milk	Number of Samples	Number Adulterated	Percentage of Adulteration
Pasteurised	561	21	3·74
Tuberculin Tested (Pasteurised)	905	81	8·95
Sterilised	466	14	3·00
Tuberculin Tested or Untreated	2,336	203	8·69
*Channel Islands (all grades)	364	42	11·53

* The figures for Channel Islands Milks are included here for completeness but for all other purposes in this report they are considered separately as they come under Regulations of their own, see page 43.

It will be noted from table 11 that pasteurised and sterilised milks show a lower rate of adulteration than the other types of milk. This is primarily because heat treated milks are normally bulked before processing and irregularities in individual churns or consignments may thereby be obscured. As against this the high adulteration rate for Tuberculin Tested milks is weighted by the selective sampling of a number of milks, taken on delivery to processing dairies, which were the subject of complaint by the dairy managements.

" Serious " Milk Adulteration

A study of table 10 reveals that 1·28 per cent. of the total milk adulteration may be considered " serious." This figure includes 33 samples which contained added water and 21 samples which were deficient in fat. A number of these seriously adulterated samples were taken informally and could not therefore, be the subject of prosecutions. In several other instances corresponding appeal-to-cow samples of poor quality were submitted by the Sampling Officers. Prosecutions were recommended, however, in respect of eighteen samples.

In table 12 are given details in regard to the adulterated milk samples, submitted by County Sampling Officers, which were the subject of legal proceedings, together with the results of the prosecutions.

Table 12

Milk Prosecutions, 1964

Number of Sample	Nature of Adulteration or Irregularity	Observations
C.2138	Deficient 12·3 per cent. solids-not-fat; freezing point indicated 10·0 per cent. extraneous water.	Section 32 (3) Food and Drugs Act, 1955. Fined £25 and and £17.17.0 costs.
N.9780	Deficient 23·3 per cent. fat and 41·4 per cent. solids-not-fat; freezing point indicated 37·9 per cent. extraneous water.	Section 32 (3) Food and Drugs Act, 1955. Fined £8 and £6.6.0 costs.
N.371	Deficient 22·6 per cent. fat.	Same vendor. Section 2 Food and Drugs Act, 1955. Fined £2 and £4.4.0 costs.
N.372	Deficient 9·3 per cent. fat.	
N.1170	Deficient 1·6 per cent. fat and 8·5 per cent. solids-not-fat; freezing point indicated 11·3 per cent. extraneous water.	Same vendor. Section 32(3) Food and Drugs Act, 1955. Fined £50 and £15.10.0 costs.
N.1186	Deficient 17·3 per cent. fat and 34·5 per cent. solids-not-fat; freezing point indicated 36·6 per cent. extraneous water.	
C.3878	Deficient 3·1 per cent. solids-not-fat; freezing point indicated 3·6 per cent. extraneous water.	Same vendor. Section 32 Food and Drugs Act, 1955. Fined £40 and £17.15.0 costs.
C.3879	Deficient 4·8 per cent. solids-not-fat; freezing point indicated 4·1 per cent extraneous water.	
C.3880	Deficient 4·2 per cent. solids-not-fat; freezing point indicated 5·1 per cent. extraneous water.	
C.3881	Deficient 5·6 per cent. solids-not-fat; freezing point indicated 5·0 per cent. extraneous water.	
C.3882	Deficient 1·0 per cent. fat and 2·7 per cent. solids-not-fat; freezing point indicated 2·1 per cent. extraneous water.	
C.3883	Deficient 1·0 per cent. fat and 2·7 per cent. solids-not-fat; freezing point indicated 4·7 per cent. extraneous water.	
C.3884	Deficient 0·6 per cent. fat and 1·1 per cent. solids-not-fat; freezing point indicated 1·5 per cent. extraneous water.	
C.3885	Deficient 3·7 per cent. solids-not-fat; freezing point indicated 4·1 per cent. extraneous water.	
C.3886	Deficient 1·4 per cent. solids-not-fat; freezing point indicated 1·6 per cent. extraneous water.	
C.3887	Deficient 2·0 per cent. solids-not-fat; freezing point indicated 1·8 per cent. extraneous water.	

Table 12—continued

Number of Sample	Nature of Adulteration or Irregularity	Observations
E.4999	Deficient 26·0 per cent. fat.	Same vendor. Section 2 Food and Drugs Act, 1955. Fined £20 and £15.10.0 costs
E.5000	Deficient 38·3 per cent. fat.	

Adulteration of Milk : the County compared with other Areas

In the following table the percentage of milk adulteration for the year 1964 is given for a number of districts in England whose figures were available at the time of writing. The corresponding figure for the County of Lancaster was 7·5 per cent. as against 5·2 per cent. in the year 1963 and 2·9 per cent. in the year 1962. The percentage of milk adulteration in the County for the year under review is higher than the average (2·9 per cent.) for the areas included in the table. The rate of adulteration in these districts varied from 12·9 to Nil per cent.

Table 13

Milk Adulteration, 1964. Various Areas

Area	Number of Samples	Per cent. of Adult.	Area	Number of Samples	Per cent. of Adult.
Derbyshire, County	163	12·9	Bristol	434	1·4
Durham, County ...	1,184	2·2	Leeds...	856	7·7
Kent, County ...	738	5·3	Leicester	997	1·1
*Somersetshire, County ...	2,506	1·7	Liverpool	2,382	2·0
Staffordshire, County ...	4,281	1·9	Manchester	1,098	1·4
Surrey, County ...	383	2·6	Portsmouth	732	0·1
Worcestershire County ...	3,783	5·8	Salford	436	0·5
Birmingham ...	2,280	0·7	Southampton ...	293	0·0

*Includes 1,044 Samples of Channel Islands Milk.

The Standards of Quality for Milk

In some countries there is a definite standard of quality required for liquid milk sold to the public ; it is then illegal to sell milk which is below that standard. In this country the law is less stringent. The present Food and Drugs Act contains no standards for milk. The position remains very much as it was before this Act came into operation, in that the one requirement laid down by law is that milk must be sold to each purchaser in the condition in which it came from the cow. If it attains a certain limit or exceeds it, it may be regarded as above suspicion, and if it is below that limit it only becomes suspect, and it falls to the lot of the person who sold it to establish, if he can, before the Court that nothing has been added to it, or no ingredient abstracted from it.

In furtherance of the principle outlined in the preceding paragraph, presumptive limits for the composition of milk were established after exhaustive enquiries by a Government Committee appointed by the Board of Agriculture in 1900. The deliberations of this Committee resulted in the making of the Sale of Milk Regulations, 1901, which were modified as regards skimmed milk in 1912. These Regulations were reproduced, in effect unaltered, in October, 1939, in the Sale of Milk Regulations, 1939, and they have been continued in force by the Food and Drugs Act, 1955. The presumptive standards are as follows :—

(1) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 3 per cent. of milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1955, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-fat, or the addition thereto of water.

(2) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 8·5 per cent. of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1955, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

(3) Where a sample of separated milk (not being condensed milk) contains less than 8·7 per cent. of milk-solids, other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1955, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

The above presumptive standards with regard to the composition of milk have, therefore, been operative for some 60 years. Within recent years, however, they have been under a considerable amount of criticism, implying that they do not accord with present day conditions. Another Government Committee was, therefore, appointed during the year 1958 to consider the composition of milk from the standpoint of human nutrition and animal husbandry and to recommend any changes in legislation considered desirable. This Committee under the Chairmanship of Dr. J. W. Cook published its report in September 1960. It recommended as far as standards of composition are concerned, that milk should still be sold as it comes from the cow but that within ten years a fixed minimum standard of 8·5 per cent. solids not-fat should apply to milk sold by retail. Similarly, for milk on sale to the consumer the presumptive standard of 3 per cent. for milk-fat should, within five years, be made an absolute minimum standard and the abstraction of fat from milk intended for sale as whole milk should be a specific legal offence. Another recommendation was that the Hortvet Freezing Point Test should be accepted in legal proceedings as proof (subject to certain provisos) of the presence or absence of extraneous water.

Channel Islands Milk and South Devon Milk

In addition to the presumptive standards of quality, which are applicable to all milk, a special standard for milk-fat of not less than four per cent. was originally prescribed in the Milk (Control and Maximum Prices) (Great Britain) Order, 1947, for " Channel Islands Milk " and for " South Devon Milk." The enforcement of this standard was the responsibility of the Ministry of Agriculture, Fisheries and Food, but during the year 1956, the Milk and Dairies (Channel Islands and South Devon Milk) Regulations came into operation and made food and drugs authorities responsible for enforcing the standard. " Channel Islands Milk " and " South Devon Milk " are defined by the Milk (Great Britain) Order, 1962, as amended, as being milk (*a*) which is produced from cows of the Channel Islands or South Devon Breed and (*b*) which is labelled " Channel Islands Milk," " Jersey Milk," " Guernsey Milk " or " South Devon Milk " when sold in a container. This last Order also prescribes maximum prices for Channel Islands and South Devon Milk. The enforcement of the maximum price is still the responsibility of the Ministry of Agriculture, Fisheries and Food, and Food and Drugs authorities are, therefore, requested to report to the Ministry details of any samples of Channel Islands and South Devon Milk sold at the higher price prescribed which are found to contain less than four per cent. of fat. This is, of course, in addition to any enforcement action in regard to fat deficiency which the Food and Drugs authority may, itself, decide to take. During the year 1964, 476 samples of Channel Islands

Milk were examined (364 were submitted by County Sampling Officers, and 112 by Autonomous Authorities). They were found upon analysis to have an average milk-fat content of 4·76 per cent. and an average solids-not-fat content of 9·03 per cent.

Of the 476 samples examined 416 were found to be satisfactory. The following brief details refer to the 60 samples (forty two County) reported upon adversely. Legal proceedings were successfully instituted in respect of two samples, No. C.2454 was deficient of 3·8 per cent. solids-not-fat and contained 6·9 per cent. of extraneous water and the producer was fined £5 and ordered to pay £4.4.0 costs. The other sample, No. N.1730 was found to be deficient of 21·2 per cent. fat and the producer was fined £5 with £3.3.0 costs. Samples No's C.2477, N.129, E.9941, N.707, C.3169, E.4308, C.3408, E.4755, E.4790, N.1229, C.3738, C.3966 and C.4244 had fat contents between 3·60 to 3·95 per cent. and the producers concerned were all cautioned and the Ministry of Agriculture, Fisheries and Food informed. Sample No. E.3682 had a fat content of only 3·7 per cent. and contained 0·02 I.U. of bacteriostat per ml. and the producer was cautioned and the Ministry of Agriculture, Fisheries and Food informed. The remaining twenty six samples all contained small amounts of penicillin and the dairies concerned were informed.

Of the eighteen unsatisfactory samples from Autonomous Food and Drugs Authorities, three samples, all submitted by the same authority, and taken from one producer's herd, gave the following results. One was deficient of 3·6 per cent. solids-not-fat and contained 8·9 per cent. extraneous water, another was deficient of 16·2 per cent. solids-not-fat and contained 20·5 per cent. extraneous water, and the third sample was deficient of 6·1 per cent. solids-not-fat and contained 11·9 per cent. extraneous water. Legal proceedings were successfully instituted in respect of these samples and the producer was fined £20 with £1.18.0 costs. Four other samples from another authority, showed, after analysis, that one had a fat content of only 3·60 per cent. and contained 4·1 per cent. extraneous water ; another sample was deficient of 1·2 per cent. solids-not-fat and contained 2·9 per cent. extraneous water, and the two remaining samples from this authority contained 1·3 and 1·4 per cent. extraneous water respectively. In each case, the producers concerned were cautioned. Of three unsatisfactory samples from a third Autonomous Authority one was found to have a fat content of only 3·60 per cent. and contained 5·1 per cent. extraneous water. A further sample proved to be genuine. Another sample from this authority contained 7·5 per cent. extraneous water and a further sample to this also proved to be genuine. The remaining sample contained 0·075 I.U. of penicillin per ml. and the producer was cautioned and the Milk Marketing

Board informed. A fourth Auotnomous Food and Drugs Authority submitted two unsatisfactory samples, one of which contained only 3·90 per cent. fat and a further sample to this was found to be genuine. The other sample contained 0·03 I.U. of penicillin per ml. and the producer and Milk Marketing Board were informed. A fifth authority had five samples of Channel Islands milk, each of which contained a small amount of penicillin, and the producers concerned were informed, also the Milk Marketing Board. Another authority submitted a sample which contained 5·1 per cent. extraneous water and a further sample to this was found to be genuine.

The Average Composition of Milk during the Year

Genuine milk has not always the same composition. There are natural variations in the amounts of both fat and solids-not-fat in milk as drawn from the cow. It, therefore, becomes a matter not only of interest but also of importance and significance, to know the average values for these two constituents. This information is given for the year 1964 in table 14, where it will be seen that the average figure for fat is 3·70 per cent., for solids-not-fat 8·60 per cent. and for total solids 12·30 per cent.

It should be pointed out that the average compositions and frequencies included in this section of the Report are calculated from the results of all the samples of milk (other than Channel Islands milk) received ; that is to say, there are included all adulterated samples and further, all appeal-to-cow samples, whether they were above or below the limits for fat and solids-not-fat laid down by the Sale of Milk Regulations. The figures for average composition calculated on this basis will, therefore, tend to be somewhat lower than those for genuine milk sold in the County.

Table 14

Average Composition of Milk, 1964

Month	Number of Samples*		Fat per cent.		Solids-not-fat per cent.		Total Solids per cent.	
January	1,094	356	3·64	3·69	8·50	8·49	12·14	12·18
February		440		3·63		8·51		12·14
March		298		3·58		8·51		12·09
April	1,146	461	3·61	3·61	8·59	8·48	12·20	12·09
May		343		3·58		8·61		12·19
June		342		3·64		8·72		12·36
July	1,056	352	3·70	3·67	8·65	8·64	12·35	12·31
August		347		3·70		8·62		12·32
September		357		3·73		8·69		12·42
October	987	391	3·86	3·85	8·68	8·72	12·54	12·57
November		403		3·92		8·67		12·59
December		193		3·77		8·60		12·37
Whole year	4,283		3·70		8·60		12·30	

* Includes Appeal-to-Cow samples but does not include Channel Islands milk.

The Average Composition of Milk for each Month of the Year

Table 14 also includes the figures for the averages of fat and solids-not-fat for each month of the year. As regards fat it will be seen that March and May have the lowest figure. 3·58 per cent., and November the highest, 3·92 per cent. In respect of solids-not-fat, the lowest figure was obtained in April, 8·48 per cent., the highest in June and October, the figure then being 8·72 per cent. These variations, particularly in respect of fat content, have been the general experience for many years, the fat content usually being at its lowest in the spring and at its highest in the autumn. Solids-not-fat tend to be lower in the winter.

The Average Composition of Morning and Evening Milk during the Year

Usually, when samples are submitted, the information is given whether they are morning or evening milks. It has, therefore, been possible to classify them so as to show the average composition of morning and evening milks separately.

When cows are milked at the usual intervals the evening milk, due to the shorter interval, is richer in fat than the morning milk, while there is little if any difference as a rule in solids-not-fat. This is illustrated in table 15 below, where the average fat for morning milk is 3·57 per cent., and the evening fat 3·97 per cent. ; the fat in the evening milk being greater by 0·40 per cent., while the averages for solids-not-fat are very similar for both morning and evening milk.

Table 15

The Average Composition of Morning and Evening Milk during the Year 1964

	Number of Samples*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk ...	948	3·57	8·61	12·18
Evening Milk ...	785	3·97	8·66	12·63
Mixed Milk ...	43	3·97	8·52	12·49
Unknown ...	2,507	3·66	8·58	12·24
Total ...	4,283	3·70	8·60	12·30

* Includes Appeal-to-Cow samples but does not include Channel Islands milk.

The Average Composition of Milk : compared with past years

In table 16 the average composition of all the milks examined is set out for the period 1910-1964. And it will be seen that the average figure for fat does not vary greatly from year to year. In respect of solids-not-fat there is very little difference in the averages for the years 1910-1940. Since 1940, however, it will be noted there has been an appreciable decrease in solids-not-fat, the lowest figure of 8·55 per cent. being obtained in the year 1943. The average for solids-not-fat for the year under review was 8·60 per cent., while the average for the whole period for which records have been kept is 8·78 per cent. Since the year 1943 there has been, in general, a tendency for solids-not-fat to show an upward trend but they are still appreciably below the pre-war figures.

Table 16

Average Composition of Milk, 1910-1964.

Year	Number of Samples	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1910 to 1930 ...	56,028	3·67	8·90	12·57
1931	3,090	3·84	8·81	12·65
1932	3,205	3·77	8·85	12·62
1933	3,060	3·76	8·82	12·58
1934	3,310	3·74	8·81	12·55
1935	3,422	3·75	8·84	12·59
1936	3,098	3·73	8·88	12·61
1937	3,278	3·74	8·84	12·58
1938	3,398	3·70	8·78	12·48
1939	3,128	3·67	8·78	12·45
1940	2,144	3·70	8·79	12·49
1941	1,866	3·70	8·64	12·34
1942	1,516	3·75	8·66	12·41
1943	1,489	3·70	8·55	12·25
1944	1,197	3·69	8·57	12·26
1945	1,096	3·72	8·57	12·29
1946	2,776	3·75	8·58	12·33
1947	4,625	3·75	8·63	12·38
1948	4,523	3·67	8·64	12·31
1949	5,210	3·66	8·65	12·31
1950	5,362	3·68	8·67	12·35
1951	5,839	3·67	8·65	12·32
1952	5,844	3·67	8·68	12·35
1953	5,922	3·68	8·68	12·36
1954	5,182	3·71	8·65	12·36
1955	5,686	3·68	8·66	12·34
1956	5,524	3·71	8·59	12·30
1957	5,485	3·68	8·63	12·31
1958	5,439	3·68	8·63	12·31
1959	5,304	3·62	8·62	12·24
1960	5,062	3·64	8·66	12·30
1961	5,216	3·66	8·66	12·32
1962	5,420	3·70	8·61	12·31
1963	4,825	3·69	8·60	12·29
1964	4,283	3·70	8·60	12·30
1910 to 1964 ...	191,852*	3·71	8·78	12·49

* Does not include Channel Islands milk and 34 samples of Milk examined for foreign matter only.

Composition of Milk : the County compared with Other Areas

In table 17 below, figures are given for the composition of milk during the year 1964 in the areas of 16 other Food and Drugs Authorities. The corresponding figures for the County of Lancaster based upon 4,283 samples of milk are fat 3·70 per cent., solids-not-fat 8·60 per cent. and total solids 12·30 per cent. It will be noted that the Lancashire figure for fat is almost identical with the average for the other areas but the figure for solids-not-fat is lower by 0·09 per cent. The average figures for the areas listed are fat 3·67 per cent., and solids-not-fat 8·69 per cent.

Table 17

Composition of Milk, 1964. Various Areas.

Area	Number of Samples	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
Derbyshire, County ...	4,283	3·70	8·60	12·30
Durham, County ...	1,209	3·71	8·67	12·38
Kent, County	744	3·65	8·68	12·33
Somersetshire, County ...	1,476	3·75	8·58	12·33
Staffordshire, County ...	4,325	3·71	8·64	12·35
Surrey, County	387	3·62	8·79	12·41
Worcestershire, County ...	823	3·73	8·69	12·42
Birmingham	2,280	3·68	8·70	12·38
Bristol	457	3·67	8·81	12·48
Leeds	856	3·76	8·68	12·44
Leicester	997	3·71	8·72	12·43
Liverpool	2,382	3·71	8·76	12·47
Manchester	1,098	3·63	8·78	12·41
Portsmouth	732	3·77	8·54	12·31
Salford	436	3·55	8·82	12·37
Southampton	293	3·65	8·65	12·30

The Composition of Milk : Frequencies

The 4,283 samples of milk examined for chemical composition during the year have been arranged in table 18 to show the number of samples having the same percentage of fat, or, in other words, the frequency with which each percentage of fat, differing by 0·1 per cent., occurred. The table has been shortened by placing in separate groups all samples containing less than 2·5 per cent. and above 3·9 per cent. This information is given for the whole year and for each month of the year.

This table gives different information than do figures for averages. It shows that, as in previous years, there are comparatively few samples below 3·0 per cent. It also shows how the figures from which the averages are calculated are distributed, information which is not obtainable from the figures for averages alone.

In this table, and the following one, table 19, all samples of milk are included whether adulterated or not, and also appeal-to-cow samples.

Table 18

Composition of Milk : Frequencies

Fat

Per cent.	Number of Samples												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 2·5	2	0	0	1	1	1	0	1	2	1	0	0	9
2·5	0	0	0	0	1	0	0	0	1	1	0	0	3
2·6	0	1	2	0	1	1	0	0	1	0	0	0	6
2·7	0	0	1	5	1	1	2	0	0	1	1	0	12
2·8	2	0	3	2	5	2	1	1	2	1	0	1	20
2·9	0	4	4	4	5	7	1	2	2	3	0	2	34
3·0	6	8	8	7	12	10	6	9	9	4	1	0	80
3·1	8	15	4	10	14	11	5	11	5	4	3	0	90
3·2	13	22	10	15	16	15	10	15	14	6	3	8	147
3·3	9	31	16	24	27	24	16	16	20	20	13	7	223
3·4	19	46	32	44	46	33	27	25	28	8	20	4	332
3·5	59	82	83	121	68	64	63	36	27	19	14	6	642
3·6	75	98	73	99	52	67	90	74	64	30	31	31	784
3·7	70	43	16	31	25	18	49	57	53	61	36	54	513
3·8	24	24	14	23	9	12	20	23	40	84	86	38	397
3·9	18	13	3	13	12	13	15	17	15	53	67	15	254
4·0 and Over	51	53	29	62	48	63	47	60	74	95	128	27	737
Totals	356	440	298	461	343	342	352	347	357	391	403	193	4,283

Table 19 gives the frequencies for solids-not-fat. It has already been stated that the average figure for solids-not-fat for the year was 8·60 per cent., and the bulk of the individual figures for solids-not-fat are arranged closely around the average. Tables 18 and 19 bring out the further point that a much higher proportion of milks fall below the presumptive limit of 8·5 per cent. for solids-not-fat than fall below the presumptive limit of 3·0 per cent. for milk-fat.

Table 19

Composition of Milk : Frequencies

Solids-not-fat

Per cent.	Number of Samples												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 7·8	2	0	0	0	0	0	0	1	0	0	4	1	8
7·8	3	0	1	0	0	0	0	0	0	0	0	0	4
7·9	3	1	0	0	1	0	0	0	1	0	0	2	8
8·0	4	3	0	4	1	0	1	1	0	2	0	0	16
8·1	1	4	9	8	3	1	0	2	2	3	1	4	38
8·2	13	19	8	22	7	2	4	5	2	7	1	2	92
8·3	21	48	27	63	8	5	4	9	9	7	9	2	212
8·4	96	114	70	156	23	14	21	22	18	8	20	7	569
8·5	136	117	106	113	86	37	80	70	37	28	65	53	928
8·6	34	69	42	42	96	71	113	91	90	85	125	75	933
8·7	20	42	16	31	65	106	82	72	84	119	82	22	741
8·8	13	13	13	12	39	56	26	38	64	83	41	12	410
8·9	7	5	1	6	10	27	14	19	27	22	25	6	169
9·0 and Over	3	5	5	4	4	23	7	17	23	27	30	7	155
Totals	356	440	298	461	343	342	352	347	357	391	403	193	4,283

Samples of Milk taken for Comparison

Part II of the Seventh Schedule of the Food and Drugs Act, 1955, contains certain provisions relating to the procuring of comparison samples of milk. Briefly, when a sample of milk is obtained from a vendor he must, if so requested, give to the Sampling Officer the name and address of the person from whom he, in turn, received the milk. The vendor may also within 60 hours of the sample being taken, serve on the Food and Drugs Authority a notice stating the name and address of the person from whom he received the milk and the time and place of delivery to himself of milk from a corresponding milking, and requesting the Authority to procure, as soon as practicable, a sample of milk from a corresponding milking in course of transit or delivery to himself. The vendor shall have no right to request such a sample if the original sample procured from him was a mixture of milk produced on more than one dairy farm. In turn, the dairymen from whom such a sample of milk is procured in course of transit or delivery, may, within 60 hours after the sample was procured, serve on the Authority concerned a notice requesting that immediate steps be taken to procure a sample of milk from a corresponding milking of the cows. The person procuring this last sample shall be empowered to take such steps at the dairy as may be necessary to satisfy himself that the sample is a fair sample of the milk of the cows when properly and fully milked. It is the practice in the County for the Sampling Officers to take, in appropriate cases, follow-up and appeal-to-cow samples without a formal request being made by the vendor.

Appeal-to-Cow Samples

Appeal-to-cow samples, or, as they are sometimes called, " byre " samples, if the method of taking them is properly carried out in every detail, may be regarded in the light of a final appeal. The milking must be carefully supervised, it must be established that the same cows are milked, that it is the corresponding milking and the dairy equipment must be inspected to see that it is clean and dry. The results of analyses of samples procured in this way must be accepted as those pertaining to genuine milk. Appeal-to-cow samples serve at least two purposes. In the first place, they show, in cases where an unsatisfactory sample has been sold, the quality of the unadulterated milk given by the cows, and, secondly, extend our knowledge of the quality of the milk of different herds and of the natural variations which may occur in the composition of genuine milk.

It was with the former object in view that the practice of taking appeal-to-cow samples was instituted, *viz.*, to ascertain the composition of the milk given by the cows. It is now generally admitted that the composition of the milk from a herd of cows may occasionally fall below the limits laid down in the Sale of Milk Regulations, particularly at the morning milking. When such a milk is examined the question arises whether it is an unadulterated milk of poor quality, or a milk of normal composition which has been tampered with ; the appeal-to-cow sample is intended to help to solve this problem.

In table 20 there is given a list of appeal-to-cow samples, submitted by the County Sampling Officers during the year 1964 and also the results of analysis. Fifteen such samples are included, representing four herds, the number of cows in the herds varying from fifteen to thirty.

In addition three appeal-to-cow samples were examined for autonomous authorities.

Analysis of Appeal-to-Cow Samples of Milk

Table 20

Number	Number of cows milked	Approx. yield gallons	Morning or Evening	Fat per cent	Solids-not-fat per cent.	Freezing Point (Hortvet) °C	Taken for comparison with numbers	Observations
1087	20	11½	E	4·33	8·09	−0·532	N.9780	Low in solids-not-fat.
1088	5	2½	E	5·08	8·04	−0·531		Rich in fat but low in solids-not-fat.
1089	5	10	M	3·47	8·91	−0·539	N.371 and N.372	
1090	4	10	M	3·10	8·64	−0·541		
1091	6	10	M	3·55	8·67	−0·535		
1092	5	10	M	3·50	8·48	−0·534		Slighty low in solids-not-fat.
1093	6	10	M	3·52	8·54	−0·531		
1094	2	3½	M	3·50	8·48	−0·528		Slightly low in solids-not-fat and abnormally high freezing point
961	7	11½	E	4·08	8·60	−0·543	E.4999 and E.5000	
962	8	9½	E	4·13	8·75	−0·542		
1128	5	9½	E	4·28	8·84	−0·547	C.3878 to C.3887 inclusive	
1129	7	10	E	4·32	8·76	−0·558		
1130	8	10½	E	4·68	8·58	−0·547		
1131	10	10	E	4·42	8·80	−0·550		
1132		5	E	4·27	8·53	−0·540		

An inspection of table 20 shows that the freezing point depression of the appeal-to-cow samples was determined in every case, and this gave valuable evidence of the authenticity of the samples. Although four of the appeal-to-cow samples were found to be naturally poor in solids-not-fat, in only one such instance was the freezing point of the sample above —0·530 °C.(Hortvet), the figure which is usually accepted as the highest freezing point normally given by milk free from extraneous water. The freezing point of the 15 appeal-to-cow samples varied between —0·528 °C. (Hortvet) to —0·558 °C. (Hortvet) ; the average figure being —0·539 °C. (Hortvet). The average freezing points of appeal-to-cow samples examined during the five years, 1959 to 1963 inclusive, were —0°540 °C., —0°542 °C., —0·539 °C., —0·538 °C. and —0·542 °C.

Milk Supplied to Schools, Day Nurseries, Children's Homes and Homes for the Aged

The 249 samples of milk marked " Private " in table 3 were taken from consignments delivered to Schools, Day Nurseries, Children's Homes and Homes for the Aged in the County. Seventeen of these were adulterated, corresponding to an adulteration rate of 6·8 per cent. This figure is lower than the total milk adulteration rate for the County which was 7·5 per cent.

Of the 249 samples, 200 were taken at Schools and thirteen of these were found to be adulterated or otherwise unsatisfactory. Ten samples contained traces of penicillin and the dairies concerned were informed. Two other samples were found to have small amounts of extraneous water and the respective vendors were cautioned. The remaining sample was slightly deficient in fat and the producer was informed.

Twenty seven samples were taken at Homes for the Aged and one of these contained a trace of penicillin. The dairy concerned was informed.

Twenty samples were taken from Day Nurseries and three of these contained traces of penicillin. The dairies concerned were informed.

Two samples were taken from Children's Homes and on examination were found to be satisfactory.

Samples of Milk deficient in solids-not-fat but genuine

Attention has already been drawn in the sections of this Report dealing with the " Standards of quality for milk," " Composition of Milk : Frequencies " and " appeal-to-cow " samples, to the fact that milk as it comes from the cow is not always of such quality as to comply with the minimum presumptive limits of 3·0 per cent. for milk-fat and 8·5 per cent. for solids-not-fat, of the Sale of Milk Regulations, 1939. In order to decide whether such samples submitted under the Food and Drugs Act were in fact as given by the cow, and therefore genuine, it is still necessary in the case of presumed fat deficiencies to make an actual comparison with an " appeal-to-cow " sample from a corresponding milking. Formerly, this was also the only means by which it could be decided whether a sample low in solids-not-fat was of naturally poor quality or whether it had been adulterated by the addition of water. For the past 30 years or so, however, it has been possible by submitting the sample to the Hortvet freezing point test for the Analyst to obtain additional evidence that a deficiency in solids-not-fat was due to the presence of extraneous water or, alternatively, that it was due to natural causes.

In the section of the revised Ministry of Health memorandum 36/Foods (1939), dealing with Public Analysts' quarterly reports, it is laid down that in the case of samples below thc presumptive limits of the Sale of Milk Regulations, the report should show whether they were adjudged genuine by the Analyst on other grounds. It is now the normal procedure to submit all samples low in solids-not-fat to the Hortvet freezing point test and to include in the quarterly reports a table giving details of such samples which satisfactorily pass the test.

During the year under review, 841 County samples of milk were found to be poor in solids-not-fat, but were adjudged genuine by the Hortvet freezing point test. This figure corresponds to 19·6 per cent. of the total milk samples (including " appeal-to-cow ") submitted by County Sampling Officers. These poor quality milks were distributed over the year as follows :—404 in the March quarter, 300 in the June quarter, 83 in the September quarter and 54 in the December quarter. The samples were not, therefore, confined to any particular season of the year, although the greatest number was obtained during the winter and spring and the lowest in the autumn. The lowest figure for solids-not-fat shown by any of these samples was 7·85 per cent., the next lowest being 7·90 per cent.

Each year it is usual to find an appreciable number of milk samples which are poor in solids-not-fat but are nevertheless adjudged genuine as the result of applying the Hortvet freezing point test. The number of such samples, *viz.*, 19·6 per cent., submitted during the year under review is higher by 7·1 per cent. than for the year 1963, when the figure was 12·5 per cent. In the five years preceding the year 1963 the percentage of milk samples coming under this heading varied from 6·7 to 12·8 per cent.

It will be noted that the percentage of milk samples poor in solids-not-fat but genuine by the freezing point test for the year 1964, *viz.*, 19·6 per cent., is very high when compared with the percentage of adulterated milk samples for the same year, *viz.*, 7·5 per cent. The difference is even more striking when it is considered that the last mentioned figure includes all samples containing extraneous water and all samples containing less than 3·0 per cent. milk-fat whether or not, in the latter instance, the corresponding appeal-to-cow samples indicated that the fat deficiences were actually due to abstraction or merely to natural causes.

The relatively high proportion of milks found to be naturally deficient in solids-not-fat, which is by no means confined to Lancashire, is undoubtedly one of the factors which influenced the Government to appoint a Committee in the year 1958 to consider the composition of milk. (The findings of this Committee are referred to in the section of this report dealing with " The Standards of Quality for Milk.")

Antibiotics in Milk

Samples of ex-farm milk have been tested in the County Laboratory for the presence of penicillin and other antibiotics since May, 1962. The Milk Hygiene Sub-Committee of the Milk and Milk Products Technical Advisory Committee appointed by the Government published on the 30th May, 1963, a report on Antibiotics in Milk in Great Britain. This report was the result of a survey carried out in the year 1961 and it indicated that 11 per cent. of the samples of milk taken in England and Wales contained penicillin or other antibiotics but 4·4 per cent. contained less than 0·04 unit per ml. of penicillin. This last figure is usually regarded as the danger limit in cheese making at or above which partial inhibition of cheese starters may occur. The presence of antibiotics, particularly penicillin, in milk mainly stems, of course, from the use of these substances in the treatment of mastitis, although farmers are advised to keep back milk from treated animals for 48 hours or longer depending on the excretion time of the preparation.

The testing of ex-farm milks for antibiotics has continued and from the end of May, 1963, all milk samples have been tested including heat treated milks and Channel Islands milks. The year under review is, therefore, the first full year that testing has been carried out on all milk samples. The test at first used was a plate culture method using spores of B-subtilis which was capable of detecting levels of the order of 0·05 unit per ml. but in October, 1963, the T.T.C. (2 : 3 : 5 triphenyltetrazolium chloride) test was adopted and this is capable of detecting levels as low as 0·01 unit per ml. This latter test depends on the fact that T.T.C. is changed from its colourless form into red formazane in the presence of actively metabolising streptococcus thermophilus B.C. In the presence of penicillin or other antibiotic which inhibits the growth of this organism either no red colour or only a faint colour develops depending on the amount of antibiotic present and the intensity of colour can be matched against standards. It is possible to confirm whether any inhibition of growth is due specifically to the presence of penicillin by carrying out another test in the presence of penicillinase.

On the 19th August, 1964, the Ministry of Agriculture, Fisheries and Food sent a circular letter, No. FSH 15/64, on antibiotics in milk to Food and Drugs Authorities. This drew attention to the fact that some dairies were already testing incoming milks from farms for antibiotics and that this would be extended to more dairies as soon as possible. The tests provisionally recommended for use in dairies are a Modified T.T.C. test and a Reverse-Phase Disc Assay Method (Kosikowski). The former test requires 2·5 mls. of sample while the full T.T.C. test uses 5 mls. of sample, the latter is, therefore, more sensitive. The Reverse-Phase Disc Assay uses agar plates seeded with Bacillus subtilis spores and special nutrient discs which are dipped into the samples, then placed on the plates and incubated. This method is similar to that originally used in the County Laboratory except that in the latter method the nutrients were added directly to the agar plates. Both the Modified T.T.C. test and the Reverse-Phase Disc Assay are capable of of detecting penicillin down to a level of about 0·05 unit per ml. and are also sensitive to other inhibiting substances. As described for use in dairies both tests are only pass or fail tests, i.e. the amounts of antibiotics present in the samples are not reported. Although the circular letter suggests that Public Analysts should use the same tests, the County Laboratory is, at least for the time being, continuing to use the full T.T.C. test which, as already mentioned, has greater sensitivity and which enables a figure for the amount of antibiotic present in a sample to be returned. This last would appear particularly desirable in relation to official action as it is then possible to say whether or not a relatively large amount of penicillin was present in the sample. Samples have, however, only been reported as positive during the latter half of the year under review when the results have indicated the presence of an amount of penicillin or other antibiotic of the order of 0·05 unit per ml. or more.

During the year under review 4,631 samples of milk (including Channel Islands Milk) taken in the County were tested for antibiotics and 185 samples (4·0 per cent.) gave positive results of which three were due to inhibiting substances other than penicillin. These samples included 2,531 samples of raw milk of which 79 (3·1 per cent.) were positive, and 2,100 samples of heat treated milk of which 106 (5·0 per cent.) were positive. The highest amount of penicillin found was 1·0 units per ml. in a sample of raw milk ; the highest amount found in a sample of heat treated milk being 0·25 unit per ml. The average amounts of antibiotic found in all samples containing it was 0·03 unit per ml. in all milks, 0·05 unit per ml. in raw milks and 0·02 unit per ml. in heat treated milks. It will be seen that while a higher percentage of heat treated milk samples were positive the amounts found were very much lower ; both these effects are due to the bulking of milk from different sources by dairies before heat treatment.

In addition to the County samples, 1,006 samples of milk submitted by Autonomous Food and Drugs Authorities were also tested for the presence of antibiotics and of these 57 (5·6 per cent.) were positive. In each instance where antibiotic was detected the results of the test were brought to the attention of the dairy or, in the case of ex-farm milks, of the farmer and the Milk Marketing Board.

Adulteration of Articles other than Milk

During the year under review there were examined for the County 3,498 samples other than milk ; of these 243 were reported against, this corresponds to an adulteration rate of 6·9 per cent., which is higher than the figure obtained in the year 1963, when it was 6·7 per cent. The percentage of adulteration in articles other than milk for the year under review, was lower than that for milk, *viz.*, 7·5 per cent. An examination of tables 3 and 21 shows that sausages, samples containing extraneous matter or insects and samples whose labels did not conform to the requirements of the Labelling of Food Order contributed especially to the overall adulteration rate. Of the 243 unsatisfactory samples, 23 consisted of sausage, 41 were incorrectly labelled and 76 contained extraneous matter or insects. These three classes of samples, therefore, accounted for 4·0 per cent. of the total of 6·9 per cent. adulterated.

Table 21 gives a list of the articles other than milk submitted by County Sampling Officers which were found to be unsatisfactory with particulars of the type of adulteration and the action taken.

Samples, other than Milk, adulterated or otherwise giving rise to irregularity.

Table 21

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.2010	Christmas Pudding	Informal	Fat content only 8·2 per cent. Poor in fat content.	No action advised.
C.2168	Cream of Curry Soup, canned	Informal	Total fat content 1·8 per cent. butterfat. Code of Practice for Cream Soups requires 2·5 per cent. butterfat if no other fat present.	Importers communicated with and remainder of stock withdrawn from sale.
C.2201	Channel Islands Milk	Informal	Contained 0·02 I.U. penicillin per ml.	Dairy informed.
E.3235	Barley and Mushroom Soup Mixture, dry	Informal	Packet contained more barley than lime beans yet "Beans" preceded "Barley" in list of ingredients on label and egg yolk content of the noodles was less than the flour yet mentioned before flour	Importers attention drawn to Labelling of Food Order. Correct labels now in use.
E.3240	Sweets (Butter Candy)	Informal	Butterfat content only 3·0 per cent. Should be not less than 4·0 per cent.	Manufacturers communicated with and taking steps to prevent a recurrence.
E.3249	Part loaf of Bread and separately three slices	Informal	Contained 0·005 gramme of partly carbonised wheat starch.	Same vendor. Bakery and complainant informed.
E.3250	Part loaf of Bread and separately three slices	Informal	Contained 0·14 gramme of dark grey coloured material consisting mainly of heated wheat starch with 0·0005 gramme iron and traces of rubber	
E.3298	Portion of Steak and Kidney Pie	Informal	Contained an iron nail 5/8 inch long weighing 0·18 gramme. The nail had dough, fat and meat adhering to it but it was not possible to state definitely that the nail was present before the pie was baked.	Bakery and complainant informed.
N.9811	Channel Islands Milk	Formal	Contained 0·02 I.U. penicillin per ml.	Producer and Milk Marketing Board informed.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.9836	Channel Islands Milk	Formal	Contained 0·01 I.U. penicillin per ml.	Producer and Milk Marketing Board informed.
N.9838	Channel Islands Milk	Informal	Contained 0·01 I.U. Penicillin per ml.	Producer and Milk Marketing Board informed.
S.4284	Sweets (white drops)	Formal	Contained 30 parts per million of discoloured dried milk particles and traces of sand. Less than 1 milligram of very fine iron turnings probably from a cleaning pad were present in the sample, otherwise genuine.	No action advised.
S.4340	Channel Islands Milk	Formal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.
S.4331	Opened can of Kidney Soup	Informal	Contained a piece of multicoloured felting re-inforced with thread approximately 4¼ inches long and weighing 35 milligrams.	Sections 2 and 113 (3) Food and Drugs Act, 1955. Fined £5 and £7.7.0 costs.
C.2233	Channel Islands Milk	Formal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.
N.9800	Colouring Material (Cochineal colouring)	Private	Consisted of a solution of the permitted food colour "Amaranth" with a glycerine fixative. Contained no cochineal. The name "Cochineal Colouring" is not the common or usual name of the food and the label bore no list of ingredients.	Old stock. Correct labels now in use.
S.4391	Channel Islands Milk	Formal	Contained 0·03 I.U. Penicillin per ml.	Dairy informed.
C.2262	Benzyl Penicillin Tablets, B.P.	Informal	Consisted of 125 milligram tablets of Penicillin V and not Benzyl Penicillin as prescribed.	Vendor communicated with. Dispensing mistake.
E.3347	Biscuits, part packet	Informal	Contained approximately 1·1 grammes of discoloured biscuit crumb containing 0·006 milligram copper.	Bakery and complainant informed.

Table 21—*continued.*

No. of Sample	Description	Formal Informal or Private	Nature of Adulteration or Irregularity	Observations
E.3348	Shrimp Salad	Informal	Labelled " . . . contains shrimps in mayonnaise. Certified colour added." Shrimp content 16 per cent. List of ingredients not in the order required.	Importers communicated with. Correct Labels now in use.
C.2311	Part Loaf of Bread	Informal	Contained 7 milligrams of carbonised wheat starch probably derived from an oven tray.	Bakery and complainant informed.
N.9901	Proprietary Sulphonamide Suspension	Informal	Total content of Sulphonamides only 183 milligrams per teaspoonful (5 mls.). Should be 500 milligrams per 5 mls.	Pharmacist communicated with and remainder of stock destroyed.
S.4456	Channel Islands Milk	Informal	Contained 0·03 I.U. Penicillin per ml.	Dairy informed.
C.2347	Almonds, Ground	Private	Acid value of extracted fat 20·7. Sample had unpleasant flavour.	Remainder of stock destroyed.
C.2363	Seidlitz Powders, B.P.C., Extra Strong	Informal	Labelled "Extra Strong Seidlitz Powder, B.P.C." Extra Strong Seidlitz Powder not official in B.P.C. 1963.	Vendor communicated with.
N.9917	Flour Confectionery (Parkin)	Informal	Contained 0·61 gramme of charred greasy cake crumb containing 0·009 gramme of paper and 0·024 gramme of sandy material.	Bakery and complainant informed.
S.4495	Baby Food (Part can of Strained Beef Broth)	Informal	Can and food stained with iron, possibly derived from seam of can.	Packers taking steps to prevent a recurrence.
E.3411	Rice, opened packet	Informal	Contained 3·7 grammes of buff coloured powdery material which consisted almost entirely of the excreta and the remains of the bodies of mites, together with live mites (Tyroglyphus farinae)	Sections 2 and 113 (1) Food and Drugs Act, 1955. Fined £5 and £11.8.6. costs.
S.4570	Fruit, canned (Grapes)	Informal	Slight hydrogen swell. Appearance of old stock.	No further stock available.

Table 21—*continued.*

No. of Sample	Description	Formal Informal or Private	Nature of Adulteration or Irregularity	Observations
S.4565	Brown Sugar	Informal	Contained 6 grammes of hard lumps of sugar contaminated with sugar cane debris, diatoms, etc., probably derived from clarifying process.	Importers taking steps to prevent a recurrence.
E.3444	Bread	Informal	Contained a partially smoked tobacco cigarette measuring approximately 1¼ inches long and weighing 0·61 gramme.	Sections 2 and 113 (3) Food and Act, 1955. Fined £10 and £9.9.0 costs.
C.2444	Channel Islands Milk	Informal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.
C.2454	Channel Islands Milk	Formal	Deficient 3·8 per cent. solids-not-fat and contained 6·9 per cent extraneous water.	Section 32 (3) Food and Drugs Act, 1955. Fined £5 and £4.4.0 costs.
E.3470	Luncheon Meat, Canned	Informal	Contents of newly opened can possessed unpleasant odour.	Further sample sent for Examination found to be Satisfactory.
E.3457	Fish, canned (Salmon)	Informal	Can unlabelled, i.e. no name of the food, no name and address of packer and no net weight of the food.	Vendor cautioned.
E.3442	Coconut, Desiccated	Informal	Contained 50 parts per million of sulphite preservative, (expressed as sulphur dioxide).	Packer communicated with.
C.2439	Soup Mixture, dried	Informal	Green split peas and yellow split peas present in smaller amounts than lentils, yet listed before lentils in declaration of ingredients. Ingredients should be listed in descending quantitative order.	Packers taking steps to prevent a recurrence.
N.131	Seidlitz Powders B.P.C. Double Strength	Informal	Weight of blue packet only 16·35 grammes. B.P.C. limits 16·6—18·4 grammes.	Manufacturer communicated with.
S.4634	Gravy Browning	Informal	Label did not bear the words "Food Colour" as required by the Colouring Matter in Food Regulations, 1957.	Manufacturer communicated with. Correct labels now in use.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
S.4635	Gravy Browning	Informal	Label did not bear the declaration as a food colour required by the Second Schedule of the Colouring Matter in Food Regulations, 1957.	Manufacturers Agreed to amend labels.
S.4628	Butter	Informal	Moisture content 16·5 per cent.; maximum permissible limit 16·0 per cent.	Importer communicated with.
C.2510	Gravy Browning	Informal	Container not labelled with the words "Food Colour" as required by the Colouring Matter in Food Regulations, 1957.	Manufacturer communicated with.
C.2477	Channel Islands Milk	Formal	Fat content 3·85 per cent. Deficient 3·7 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and and Food informed.
E.3485	Flour Confectionery (Lemon Swiss Roll)	Informal	Contained a dark coloured fragment of cake mix which weighed 9 milligrams.	Complainant and bakery informed.
N.129	Channel Islands Milk	Formal	Fat content 3·75 per cent. Deficient 6·2 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
N.147	Channel Islands Milk	Formal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.
S.4627	Channel Islands Milk	Formal	Contained 0·02 I.U. Penicillin per ml.	Producer and Milk Marketing Board informed.
S.4652	Channel Islands Milk	Formal	Contained 0·01 I.U. Penicillin per ml.	Dairy informed.
S.4656	Channel Islands Milk	Formal	Contained 0·05 I.U. penicillin per ml.	Producer and Milk Marketing Board informed.
N.169	Pork Sausage	Informal	Contained 60 parts per million of sulphite preservative expressed as sulphur dioxide without declaration.	Vendor cautioned.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.170	Beef Sausage	Informal	Contained 200 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.3564	Ready Cooked Ginger Pudding	Informal	Lower part of pudding infested with fungus of the nature of aspergillus repens.	Complainant informed and packers interviewed.
E.3565	Portion of Cheese and Onion Pie	Informal	Contained a moth similar to a clothes moth.	Complainant informed and Bakery interviewed.
S.4667	Fish, Canned (Shrimps)	Informal	Contained 55 parts per million formaldehyde.	No action advised.
S.4706	Pork Sausage	Informal	Meat content only 62·0 per cent.	Poor in meat content.
N.208	Casserole of Hot Pot, Canned	Informal	Contained approximately half an ounce of haricot beans not declared in list of ingredients on label.	Correct labels now in use.
E.3645	Channel Islands Milk	Formal	Contained 0·02 I.U. Penicillin per ml.	Producer and Milk Marketing Board informed.
E.3692	Trifle	Informal	Contained 0·113 gramme of a mixture of fat with raw and dextrinised starch, stained with 2 milligrams of iron.	Manufacturer cautioned and complainant informed
E.3682	Jersey Milk	Formal	Fat content 3·7 per cent. Deficient 7·5 per cent. fat and contained 0·02 I.U. bacteriostat per ml.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
E.3696	Meat, Cooked (Beef Hamburger)	Informal	Meat content only 65·5 per cent.	Poor in meat content.
E.3708	Channel Islands Milk	Informal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.
E.3738	Channel Islands Milk	Informal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.301	Meat, canned	Informal	Meat content only 68·0 per cent. should be 75 per cent. Words "Beef Steak" on label in very much more conspicuous lettering than "with gravy". All words in name of the food should be given equal prominence.	Importers agreed to use correct labels in future.
N.321	Soup Mixture, Dry	Informal	Lentils and yellow split peas present in greater weights than green split peas. Ingredients declared in wrong order in list printed on package.	Packers taking steps to prevent a recurrence.
C.2726	Channel Islands Milk	Informal	Contained 0·01 I.U. Penicillin per ml.	Dairy informed.
N.352	Fruit, Canned (Prunes)	Informal	Contained 290 parts per million Tin. Recommended maximum limit 250 parts per million.	See Sample No. N.426
E.3848	Channel Islands Milk	Informal	Contained 0·03 I.U. Penicillin per ml.	Dairy informed.
N.363	Part of a Meat and Potato Pie	Informal	Contained one small dead slug weighing 0·103 gramme and measuring approximately 0·5 inch in length	Bakery cautioned and complainant informed.
N.376	Channel Islands Milk	Formal	Contained 0·01 I.U. Penicillin per ml.	Producer and Milk Marketing Board informed.
C.2742	Soda Water	Informal	Contained a small deposit of dead fungus spores.	Manufacture communicated with.
N.426	Fruit, Canned (Prunes)	Informal	Contained 260 parts per million Tin. Recommended maximum limit 250 parts per million.	Same source as Sample No. N.352 Manufacturers informed.
N.448	Channel Islands Milk	Formal	Contained 0·01 I.U. Penicillin per ml.	Producer and Milk Marketing Board informed.
S.4807	Lard	Informal	Contained two antioxidants, butylated hydroxy anisole 15 parts per million and butylated hydroxy toluene 46 parts per million. Declaration on label omits butylated hydroxy toluene.	Importers communicated with and amended labels now in use.

Table 21—continued.

No. of Sample	Description	Formal Informal or Private	Nature of Adulteration or Irregularity	Observations
E.9941	Channel Islands Milk	Formal	Fat content 3·90 per cent. Deficient 2·5 per cent fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed. Further sample genuine.
E.3977	Channel Islands Milk	Formal	Contained 0·02 I.U. Penicillin per ml.	Dairy informed.
C.2846	Dessert Powder	Informal	List of ingredients on inner packet differs from list of ingredients on outer carton.	Importers communicated with and correct labels now in use.
C.2847	Mayonnaise with Cream	Informal	Total fat content 56·0 per cent. of which not more than 3·8 per cent. consisted of butter fat. Translation of German label describes food as "Mayonnaise with Cream" and pictorial representation of cream carton appeared on label.	Importers have now ceased importing this commodity.
C.2857	Beef Sausage	Informal	Contained 220 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
C.2653	Cake	Informal	Sample infested with mould	Section 2 Food and Drugs Act, 1955. Fined £5.5.0 and £9.9.0 costs.
E.3948	Channel Islands Milk	Formal	Contained 0·01 I.U. Penicillin per ml.	Dairy informed.
E.3984	Channel Islands Milk	Formal	Contained 0·01 I.U. Penicillin per ml.	Dairy informed.
C.2890	Fruit, Dried (Dates)	Informal	Slightly affected by fungal growth (asperigillus niger).	Remainder of stock withdrawn from sale.
C.2898	Ice Lolly Syrup	Informal	The trade name " Edifas " which appears in the list of ingredients on label instead of "Methyl Cellulose" is not the common or usual name of the ingredient.	Manufacturers agreed to amend labels.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.4015	Meat and Potato Pies	Informal	28 grammes of the potato filling was discoloured grey with 0·04 per cent. Iron and contained 6·5 parts per million Copper.	Baker and complainant informed.
E.4013	Proprietary Penicillin V Suspension	Informal	Contained only 59·6 milligrams of phenoxymethyl penicillin potassium in 5 mls. Should contain 125 milligrams in 5 mls.	Vendor communicated with. Error stated to be due to dispensing.
C.2937	Ice-Cream	Informal	Milk solids other than fat only 6·3 per cent. Food Standards (Ice-Cream) Regulations, 1959, require 7·5 per cent. milk solids other than fat.	Vendor cautioned.
E.4050	Channel Islands Milk	Formal	Contained 0·01 I.U. Penicillin per ml.	Dairy informed.
S.4834	Gravy Browning	Informal	Bottle not labelled with the words "Food Colour".	Correct labels now in use.
E.4073	Fish, Canned	Informal	(1) Contained 290 parts per million tin. Maximum recommended limit 250 parts per million. (2) Two labels, naming the food differently—one correctly stated "Brisling in Olive Oil" and the other stated "Packed in Tomato Sauce".	Vendor cautioned.
E.4106	Pickles	Informal	Contained 0·7 per cent. salt and 0·005 per cent. saccharin yet saccharin listed before salt on label. Ingredients listed in wrong order and list omitted onions.	Packers taking steps to prevent a recurrence.
E.4123	Channel Islands Milk	Formal	Contained 0·075 I.U. Penicillin per ml.	Producer and Milk Marketing Board informed.
S.4825	Milk, Condensed, Full Cream, Unsweetened	Informal	Milk solids in can equivalent to only 0·745 pints (0·75 pints declared). Declared weight of contents of can (170 grammes) equivalent to only 0·74 pints.	Importers communicated with.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.653	Borax	Informal	Contained 30 parts per million of Arsenic, i.e. 26 parts per million Arsenic in excess of B.P. maximum limit. Should be labelled "Household Borax" and "not for internal use."	Correct labels now in use.
E.4168	Chicken, Canned	Informal	Chicken content only 78·0 per cent. Should be labelled "chicken in chicken jelly".	Manufacturers agreed to amend labels.
N.696	Ice-Cream	Informal	Fat content only 4·0 per cent. Should be not less than 5·0 per cent.	Vendor interviewed and cautioned.
E.3566	Tomatoes, Opened Can	Informal	Contained five unidentified fly larvae each approximately 10 millimetres long.	Importers communicated with, and complainant informed.
N.707	Channel Islands Milk	Formal	Fat content 3·95 per cent. Deficient 1·2 per cent. fat.	Producer and Milk Marketing Board informed.
S.4891	Mixed Pickles	Informal	"Onions" present in greater amount than "Cauliflower" although listed after cauliflower in statement of ingredients.	Packers agreed to use correct labels in future.
E.4215	Sausage Roll	Informal	Contained one soft-iron peg of the nature of a rivet measuring approximataly two-thirds of an inch long by one tenth of an inch in diameter and weighing 0·74 gramme.	Manufacturer cautioned.
N.729	Beef Sausage	Informal	Contained 170 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.4260	Golden Raising Powder	Informal	Available carbon dioxide only 5·7 per cent. Minimum standard 6·0 per cent.	See sample No. E.4443
N.654	Flour, Plain	Informal	Creta praeparata 169 milligrams per 100 grammes (limits 235–390 milligrams per 100 grammes). Nicotinic acid 1·48 milligrams per 100 grammes (limit not less than 1·6 milligrams per 100 grammes.)	Millers communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.3144	Part sliced loaf of bread	Informal	Contained a smoked tobacco cigarette end measuring approximately three-fifths of an inch long and weighing 0·34 gramme.	Bakery cautioned and complainant informed.
N.727	Lard	Informal	Contained 15 parts per million of butylated hydroxy anisole without declaration.	Packers agreed to use correct labels in future.
C.3169	Channel Islands Milk	Formal	Fat content 3·85 per cent. Deficient 3·75 per cent fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
E.4298	Skinless Sausage, Opened Can	Informal	Contained a beetle resembling cantharis rustica, but not positively identified with any British species.	Importers communicated with and taking steps to prevent recurrence.
N.774	Creamed Rice Milk Pudding Canned	Informal	Contained several minute dark-coloured particles of clay.	Manufacturers taking steps to prevent a recurrence. Complainant informed.
E.4308	Channel Islands Milk	Formal	Fat content 3·75 per cent. Deficient 6·2 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
E.4318	Gin	Formal	Contained 3·5 per cent. of water in excess.	Section 2, Food and Drugs Act, 1955. Fined £10 and £7.15.0 costs.
C.3181	Cough Medicine	Informal	Morphine content 0·015 per cent. Morphine from declared formula should be not greater than 0·0066 per cent.	Vendor communicated with and taking steps to avoid recurrence.
E.3568	Butter	Informal	Contained a single split fibre resembling coconut fibre 1·7 centimetres long and weighing 4 milligrams.	Importers communicated with and taking steps to prevent recurrence. Complainant informed.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.831	Ice-Cream	Informal	Fat content 4·9 per cent. Should be not less than 5·0 cent.	Vendor interviewed and further sample genuine.
E.4385	Soup Mixture, Dry	Informal	Packet bore no declaration of ingredients.	Packers communicated with.
E.4431	Bread (2 slices and a part eaten slice)	Informal	Contained one small beetle (Ptinus tectus) weighing 3 milligrams.	Bakery cautioned and complainant informed.
C.3200	Tomatoes, Fresh	Informal	Contained approximately 2 parts per million of an unidentified organo-chlorine pesticide.	Attempt to trace grower to ascertain nature of the spray used proved unsuccessful.
E.4396	Pork Sausage	Informal	Contained 160 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor interviewed and cautioned.
C.3223	Flour, Plain	Informal	Creta praeparata 600 milligrams per 100 grammes. Limits 235–390 milligrams per 100 grammes.	Miller communicated with.
E.4412	Fruit, Fresh (Strawberries)	Informal	Approximately 75·0 per cent. of the fruit in the punnet was mouldy when submitted.	Vendor interviewed and cautioned.
C.3255	Flour, Plain	Informal	Nicotinic acid only 1·47 milligrams per 100 grammes, (limit not less than 1·6 milligrams per 100 grammes). Slightly low in nicotinic acid content.	No action advised.
E.4408	Cream Cake	Informal	Filling consisted of sweetened imitation cream.	Vendor interviewed and cautioned.
E.4410	Sauce	Informal	Contained 240 parts per million of sulphite preservative (expressed as sulphur dioxide). Maximum permitted 100 parts per million and label bore no declaration of presence of preservative.	See sample No. E.4523.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.4443	Golden Raising Powder	Informal	Available Carbon Dioxide only 5·1 per cent.	Manufacturer communicated with and remainder of stock withdrawn from sale.
C.2655	Bread (part sliced loaf)	Informal	Contained 0·29 gramme of discoloured dough containing 1·5 milligrams of iron and 0·04 gramme of mineral oil.	Bakery and complainant informed.
C.3316	Dairy Ice-Cream	Informal	Milk solids-other-than fat 7·1 per cent. Should be 7·5 per cent.	Manufacturer interviewed.
E.4430	Mixed Cut Peel	Informal	Soluble solids by refractometer only 53·8 per cent. Should be 64·0 per cent.	See Sample No. E4543.
C.3351	Flour Confectionery	Informal	Contained 0·097 gramme of burnt cereal crumb contaminated with 100 parts per million zinc.	Referred to Food and Drugs Authority concerned and complainant informed.
E.4512	Lemonade (part filled bottle)	Informal	Sample had slight phenolic taint due to presence of 0·001 gramme of cresols on the rubber ring of the stopper.	Manufacturer cautioned.
E.4513	Butter	Informal	Contained a fragment of an unidentified stiff vegetable brush fibre measuring 14 millimetres in length.	Packers taking steps to prevent a recurrence.
C.3386	Dairy Ice-Cream	Informal	Total milk fat only 4·85 per cent. Should be not less than 5·0 per cent.	Manufacturer cautioned.
C.3387	Ice Lollies	Informal	Contained no ice-cream yet labelled with a list of ingredients appropriate to a lolly containing ice-cream.	Manufacturer informed and correct labels now in use.
C.3388	Dairy Ice-Cream	Informal	Milk fat only 4·9 per cent. Milk solids-not-fat only 7·0 per cent. Should be:—respectively 5·0 per cent. and 7·5 per cent.	Manufacturer cautioned.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.4523	Sauce	Formal	Contained 125 parts per million excess sulphur dioxide and no declaration of preservative on label.	Same Source as sample No E.4410 Regulations 3(1) (*a*) and 8(I) Preservatives in Food Regulations, 1962 and Section 113 (3) Food and Drugs Act, 1955. Fined £15 and £8.2.6. costs.
C.3404	Margarine	Informal	Small discloured areas of a penicillium mould growth were present between the fat surface and the overlapping side of the paper wrapper.	Vendor cautioned and complainant informed.
C.3408	Channel Islands Milk	Formal	Fat content 3·70 per cent. Deficient 7·5 per cent. fat.	Vendor cautioned and Ministry of Agriculture, Fisheries and Food informed.
E.3569	Bread (part of white sliced Loaf)	Informal	Contained 2·5 grammes of hard dried dough baked on and near the top crust.	Bakery interviewed and complainant informed.
E.4543	Mixed Cut Peel	Formal	Soluble solids only 55·4 per cent. Deficient 13·4 per cent. of the minimum percentage of soluble solids.	Same source as sample No. E.4430 Section 2, Food and Drugs Act, 1955. Fined £5 and £14.0.0. costs.
N.976	Ice-Cream	Informal	Fat content 4·9 per cent. Should be not less than 5·0 per cent.	Manufacturer interviewed and cautioned.
N.982	Pork Sausage	Informal	Meat content only 56·0 per cent. Poor in meat content. Contained 125 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.3442	Skimmed Milk with Non-milk fat "concentrated liquid"	Informal	Label did not comply with the Labelling Provisions of the 1st Schedule of the Skimmed Milk with Non-milk Fat Regulations, 1960. Ministry of Agriculture, Fisheries and Food has, however, circulated proposals to include this product in the exemptions given in the 2nd Schedule.	No action advised.
N.1000	Slice of Bread	Informal	Contained 1·4 grammes of brown flour crumb, otherwise genuine.	Bakery and complainant informed.
N.1016	Pork Sausage	Informal	Meat content 53·5 per cent.	Poor in meat content.
S.5089	Corned Beef, Part opened can	Informal	Consisted of a liver paté.	See sample No. S.5090.
S.5090	Corned Beef, Canned	Informal	Consisted of a liver paté.	Packers taking steps to prevent a recurrence and complainant informed. Remainder of small stock withdrawn from sale.
E.4623	Pork Sausage	Informal	Meat content 64·0 per cent. Slightly low in meat content Contained 260 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.
E.4625	Beef Sausage	Informal	Meat content 49·0 per cent. Slightly low in meat content Contained 310 parts per million of sulphite preservaative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.
N.1046	Rhubarb, part opened can	Informal	Contained a dead slug weighing 170 milligrams. It was not possible to prove that the slug was in the can before it was opened.	Complainant and packers informed
N.1069	Pork Sausage	Informal	Contained 275 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned

Table 21—continued.

No. of Sample	Description	Formal Informal or Private	Nature of Adulteration or Irregularity	Observations
N.1066	Pork Sausage	Informal	Contained 220 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
N.1067	Pork Sausage	Informal	Meat content 59·0 per cent.	Poor in meat content.
N.1068	Pork Sausage	Informal	Meat content 47·0 per cent. Poor in meat content. Contained 115 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
E.4572	Jellied Pork, Canned	Informal	Meat content 70·0 per cent. Low in meat content	No further stock available.
E.4652	Stewed Steak, Canned	Informal	Meat content only 68·0 per cent. Words "Stewed Steak" on label were more prominent than lettering "with Rich Gravy".	Manufacturers communicated with.
C.3494	Part Cheese and Onion Pie	Informal	The foreign matter submitted with the part pie consisted of a wood shaving which weighed 0·028 gramme.	Manufacturer cautioned and complainant informed
E.3570	Comfrey	Informal	Alkaloids of Belladonna herb, calculated as hyoscyamine 0·115 per cent.	Wholesalers and importers communicated with and stocks withdrawn from sale.
E.3571	Comfrey	Informal	Contained 27·0 per cent. of Belladonna herb.	See sample No. E.3570.
C.3481	Zinc Ointment, B.P.	Informal	Zinc Oxide content 22·9 per cent. B.P. limits 14·0–16·0 per cent.	Manufacturers communicated with and stocks withdrawn.
C.3474	Camphorated Oil B.P.	Informal	Contained only 17·7 per cent. Camphor. B.P. limits 19·0–21·0 per cent.	Vendor communicated with and remainder of stock withdrawn from sale.
C.3476	Cooking Oil	Informal	Did not consist of pure maize oil. Contained approximately 55·0 per cent. Ground Nut Oil.	Packers communicated with and taking steps to prevent a recurrence.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.1145	Baby Food (Oxtail and Carrot Dinner)	Informal	Contained a fragment weighing 16 milligrams which consisted of skin and muscle with a few attached bovine hairs.	Complainant and packers informed.
C.2656	Luncheon Meat, part opened can	Informal	Meat surface stained with 0·05 milligram of iron.	Complainant informed.
E.4755	Channel Islands Milk	Formal	Fat content 3·70 per cent. Deficient 7·5 per cent fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
N.1172	Soft Drink (Lime and Lemon)	Informal	Fruit juice content only approximately 3 per cent. Standard prescribed is 5 per cent.	Manufacturers communicated with.
E.4790	Channel Islands Milk	Formal	Fat content 3·60 per cent. Deficient 8·75 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
C.3596	Mixed Cereal	Informal	Infested with the case-bearing clothes moth.	Section 2, Food and Drugs Act, 1955. Discharged on payment of £18.5.0 costs.
E.4811	Orange Drink (23 one-third pint bottles)	Informal	No name of foodstuff and no name and address of packer. 14 of the bottles were in a dirty condition due to mould growth and algae, flies and a beetle.	Packer cautioned.
C.3557	Camphorated Oil, B.P.	Informal	Contained only 18·2 per cent. Camphor. B.P. limits 19·0–21·0 per cent.	Vendor communicated with. No further stock available.
N.1229	Channel Islands Milk	Informal	Fat content 3·90 per cent. Deficient 2·5 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
E.3572	Bread	Informal	Contained a dead wasp embedded in the crust of the base of the loaf.	Bakery cautioned.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.3573	Portion of Meat Pie	Informal	When submitted the sample was coloured salmon pink and green with two moulds, i.e. Monilia Sitophila and a Penicillin species. The sample was free from significant amounts of toxic metals.	Complainant informed.
E.3657	Ice-Cream	Informal	Fat content only 4·5 per cent. Should be not less than 5·0 per cent.	Vendor cautioned.
E.4865	Frozen Garden Peas	Informal	Contained a dead and dried-out beetle (Sphodrus leucophthalmus) weighing 130 milligrams.	Packers cautioned and taking steps to prevent a recurrence.
N.1251	Grapefruit, Opened Can	Informal	Contained a white plastic disc 1½ inches in diameter and weighing 2·07 grammes.	Importers communicated with.
C.3714	Dairy Ice-Cream	Informal	Milk fat content only 2·95 per cent. Should be not less than 5·0 per cent.	Vendor interviewed and cautioned.
C.3716	Ice-Cream	Informal	Fat content only 4·6 per cent. Should be not less than 5·0 per cent.	Vendor cautioned.
E.4875	Malt, Milk and Cocoa Beverage	Informal	Vitamin B_1 content only 0·25 milligram per ounce compared with 0·3 milligram per ounce declared.	Manufacturers communicated with.
E.4904	Gravy Browning	Informal	Bottle not labelled with the words "FOOD COLOUR" as required by the Colouring Matter in Food Regulations, 1957.	Manufacturer communicated with and will use correct labels in future.
C.3738	Channel Islands Milk	Formal	Fat content only 3·95 per cent. Deficient 1·25 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
C.3731	Beef Sausage	Informal	Contained 500 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration, an excess of 50 parts per million above the limit, and a small strip 14×3 millimetres of a white chlorinated rubber.	Vendor cautioned.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.1248	Semolina	Informal	Packet contained approximately three dozen book-lice.	Remaining stock surrendered and destroyed.
E.3574	Portion of a Meal	Informal	Contained the greater part of one dead cockroach measuring 18 × 9 millimetres and weighing 0·200 gramme, one Golden Spider Beetle (Niptus hololeucus) measuring 4 × 2½ millimetres and weighing 7 milligrams and a small grub measuring 5 millimetres in length and weighing 4 milligrams.	Section 2, Food and Drugs Act, 1955. Fined £25 and £7.15.0 costs.
N.1309	Canned Food (sold as "Mystery Meal")	Informal	Steak with gravy and onons (meat content 65·0 per cent.) Sold without a label i.e. (1) No name of the food (2) No list of ingredients. (3) No name and address or trade mark. (4) No declaration of net weight.	Same vendor. Vendor cautioned and remainder of stock withdrawn from sale.
N.1310	Canned Food (sold as "Mystery Meal")	Informal	Beef broth sold without a label, i.e. (1) No name of food. (2) No list of ingredients. (3) No name and address or trade mark. (4) No declaration of net weight.	
E.3575	Portion of Ham and Tongue Sandwich	Informal	At the time of submission to the laboratory, spoilage of the meat masked any other taint. The margarine was free from rancidity.	Complainant informed.
S.5190	Peeled Shrimps in Brine, Canned	Informal	Contained 555 parts per million benzoic acid.	See sample No. S.5125.
C.3794	Bread, part loaf	Informal	Contained 51 milligrams of dough contaminated with 3 milligrams of mineral oil and slightly stained with 0·15 milligram iron.	Bakery cautioned and complainant informed.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
S.5125	Peeled Shrimps in Brine, Canned	Formal	Contained 610 parts per million benzoic acid.	Regulation 3 (1) and (2) and Regulation 8 (1) Preservatives in Food Regulations, 1962 Fined £5 and £18.5.0 costs.
E.3576	Mineral Water part filled bottle.	Informal	Contained 14 milligrams of paraffin in the contents of the bottle and the rubber ring liner to the cap.	Packers cautioned and complainant informed.
N.1352	Pork Sausage	Informal	Meat content 53·5 per cent. Poor in meat content. Contained 140 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.
S.5139	Gravy Browning	Informal	Bottle not labelled with the words "FOOD COLOUR."	Same manufacturer as Sample No. E.4904.
N.1321	Ice-Cream	Informal	Fat content only 4·8 per cent. Should be not less than 5·0 per cent.	Vendor cautioned.
C.3869	Glycerin, B.P.	Informal	Contained 0·3 per cent. excess water.	No action advised.
E.5	Plain Flour	Informal	Creta praeparata 480 milligrams per 100 grammes. Limits 235–390 milligrams per 100 grammes.	No action advised.
E.33	Fruit Juice, Canned	Informal	Labelling of Food Order requires declaration of Vitamin C in milligrams per fluid ounce (not total Vitamin C in can).	Manufacturer communicated with and correct labels now in use.
S.5219	Tincture or Iodine, B.P.	Informal	Iodine content 2·77 per cent. (B.P. limits 2·4 to 2·7 per cent.). Potassium Iodide content 2·84 per cent. (B.P. limits 2·4 to 2·7 per cent.).	Packer communicated with.
E.3577	Bread	Informal	Contained one housefly (Musca Domestica) weighing 4 milligrams and measuring 6½ millimetres by 2 millimetres.	Bakery cautioned.
N.1467	Rice	Private	Infested with mites and Psocoptera (book lice).	Remaining stock surrendered and destroyed.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
S.5242	Rice	Informal	Contained one live grain weevil and one dead beetle (Rhizopertha Dominica).	Remaining stock surendered and destroyed.
S.5250	Barley	Informal	Infested with mites.	Remaining stock surrendered and destroyed.
C.3966	Channel Islands Milk	Formal	Fat content 3·80 per cent. Deficient 5·0 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
C.3973	Cooked Sausage	Informal	Sample contained 14 small fragments of stone, (weighing 0·09 gramme) adhering to the outside of one of the pieces of sausage.	Vendor and complainant informed.
E.3578	Mineral Water (part-filled bottle)	Informal	Sample had slight phenolic taste due to presence of 0·75 milligram of cresols in the drink and on the rubber ring of the stopper.	Manufacturer cautioned and complainant informed.
N.1508	Corned Beef, opened can	Informal	Contained 1·0 gramme of somewhat unsightly coagulated blood	Manufacturer and complainant informed.
C.3976	Children's Soluble Aspirin Tablets	Informal	Contained three times the B.P. limit for free salicylic acid.	Remainder of stock withdrawn from sale.
C.3979	Vegetables, Dried (Lentils)	Informal	Contained 0·35 gramme of four varieties of weed seed.	Vendor communicated with.
S.5274	Rice	Informal	Contained approximately 100 mites.	Remaining stock surrendered and destroyed.
C.2022	Creamed Rice Milk Pudding, opened can	Informal	Approximately one third of a square inch of the top of the pudding was slightly discoloured with 0·001 gramme of rust.	Complainant informed.
E.105	Proprietary Sulphonamide Suspension	Informal	Total content of sulphonamides only 113 milligrams per teaspoonful (5 mls.). Should be 500 milligrams per 5 mls.	Remainder of stock withdrawn from sale.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
E.157	Strawberries opened can	Informal	Contained one dead Carabid beetle measuring 17 millimetres in length and weighing 0·18 gramme.	Importers taking steps to prevent a recurrence.
S.5287	Barley	Informal	Contained approximately 200 mites.	Remainder of stock surrendered and destroyed.
N.1579	Cut Mixed Peel	Informal	Carton bore no list of ingredients. Name and address of the packer also not stated	Packer communicated with and correct labels now in use.
N.1583	Channel Islands Milk	Informal	Contained 0·3 I.U. Penicillin per ml.	Dairy informed.
C.4459	Vegetables, Dried	Private	Contained approximately half a gramme of small stones, seed cases and book lice.	Remaining stock surrendered and destroyed.
N.1592	Suet, Shredded	Private	Beef fat only 71·0 per cent. Should be 83·0 per cent.	Warden informed.
N.1654	Butter Pie (part only).	Informal	Contained one dead house fly weighing 23 milligrams.	Section 2 Food and Drugs Act, 1955. Fined £5 and £7.15.0 costs.
E.3580	Rice	Private	Contained one small fragment of stone weighing 7 milligrams in 9 ounces of sample, otherwise genuine.	See sample No. E.3581.
E.3581	Rice	Private	Contained 14 small stones weighing 0·27 gramme, together with 0·62 gramme of brown discoloured rice grains and 0·13 gramme of other cereal grains.	Suppliers communicated with and remainder of stock withdrawn from sale.
C.4097	Children's Cough Medicine	Informal	Contained the synthetic colouring matter "Bordeaux B" which is not a permitted food colour and is therefore undesirable in a cough syrup.	Old stock. New formulation now in use.
E.310	Proprietary Travel Sickness Tablets	Informal	Not labelled with the special cautionary wording.	Vendor communicated with.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
N.1676	Chopped Ham with with Pork (Two slices from an opened can)	Informal	Contained a Lymph nodule which weighed 0·47 gramme	Packer and complainant informed.
N.1672	Pork Sausage	Informal	Meat content 62·5 per cent. Poor in meat content. Contained 185 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned re preservative.
C.4118	Tomato Puree, Canned	Informal	Contained 380 parts per million of tin. Recommended maximum limit 250 parts per million.	See sample No. C.4270.
S.5385	Barley	Informal	Contained approximately 200 mites in the half pound sample.	Remaining stock surrendered and destroyed.
C.4114	Plain Flour	Informal	Creta praeparata only 120 milligrams per 100 grammes. Should be 235–390 milligrams per 100 grammes.	Millers communicated with.
E.354	Bread (portion of)	Informal	Contained 1·1 grammes of discoloured dough which included some small fragments of meat and 10 milligrams stained bright blue. The blue staining was probably due to fragments of an indelible pencil.	Bakery cautioned and complainant informed.
N.1730	Channel Islands Milk	Formal	Fat content 3·15 per cent. Deficient 21·2 per cent. fat.	Regulation 4, Milk and Dairies (Channel Islands and South Devon Milk) Regulations. Fined £5 and £3.3.0 costs
C.4116	Yoghourt (Black-currant Flavoured)	Informal	Contained 5·4 per cent of Proof Spirit due to actively fermenting yeasts.	Manufacturer interviewed and cautioned.
C.4135	Beef Sausage	Informal	Contained 270 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.

Table 21—continued.

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.4141	Christmas Tree Decorations, Edible	Informal	One dog hair was present inside the foil wrapper of one of the chocolate shapes.	Manufacturer taking steps to prevent a recurrence.
C.4161	Dripping	Informal	Free fatty acids (expressed as oleic acid) 2·0 per cent. Should be not greater than 1·5 per cent.	Manufacturer taking steps to prevent recurrence.
E.340	Cereals and Pulses	Informal	Sample heavily infested with mites.	Remaining stock surrendered and destroyed.
N.1710	Plain Flour	Informal	Creta praeparata only 72 milligrams per 100 grammes. Iron content only 1·3 milligrams per 100 grammes. Limits—Creta praeparata 235–390 milligrams per 100 grammes. Iron not less than 1·65 milligrams per 100 grammes.	Millers taking steps to prevent a recurrence.
C.4213	Cake Decorations, Edible	Informal	Sample weighed 195 grammes but declared at 200 grammes.	Weights and Measures Inspector informed.
E.406	Mincemeat	Informal	Soluble solids content only 64·2 per cent. Should be not less than 65·0 per cent.	Manufacturer taking steps to prevent a recurrence.
N.1711	Marzipan	Informal	Nut base deficient of approximately 5·0 per cent. Almond Oil.	Manufacturer taking steps to prevent a recurrence.
N.1742	Pork Sausage	Informal	Contained 190 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.
C.4244	Channel Islands Milk	Formal	Fat content 3·90 per cent. Deficient 2·5 per cent. fat.	Producer cautioned and Ministry of Agriculture, Fisheries and Food informed.
E.421	Beef Sausage	Informal	Contained 160 parts per million of sulphite preservative (expressed as sulphur dioxide) without declaration.	Vendor cautioned.

Table 21—*continued.*

No. of Sample	Description	Formal, Informal or Private	Nature of Adulteration or Irregularity	Observations
C.4270	Tomato Puree Canned	Informal	Sample consisted of three cans. Tin contents 350, 370 and 440 parts per million respectively.	Further sample to No. C.4118 Remainder of stock withdrawn from sale.
E.457	Bread (2 Slices)	Informal	Contained one pellet of rodent excrement weighing 65 milligrams.	Section 2, Food and Drugs Act, 1955. Fined £15 and £9.17.0 costs.
S.5521	Pork Sausage	Informal	Meat content only 62·0 per cent.	Poor in meat content.
C.4340	Plum Pudding	Informal	Fat content only 6·3 per cent.	Poor in fat content.
S.5517	Shredded Suet	Informal	Beef fat content only 79·0 per cent. Should be 83·0 per cent.	Manufacturer communicated with.
N.286	Bread, Brown	Informal	Contained a streak of browner dough probably caused by inadequate mixing or addition of brown flour to the dough, otherwise genuine.	Bakery and complainant informed.

The Labelling of Food Order

The first Labelling of Food Order was made in the year 1944, but it has been amended or re-enacted on several occasions since that time. The Order at present in force is the Labelling of Food Order, 1953, which came into operation on the 5th April of that year and which has been kept in force by the Twelfth Schedule of the Food and Drugs Act, 1955. Five amendment regulations to the Labelling of Food Order, 1953, were made in the years, 1953, 1955, 1958, 1959 and 1961. No amendments to the Order were made during the years 1962 and 1963 but the Food Standards Committee published in 1964 a report on food labelling which is referred to at the beginning of this report and which reviews the whole question of food labelling, as distinct from claims and advertisements which are to be the subject of a second report.

During the year under review 77 samples (41 County and 36 from Autonomous Authorities) were found to contravene the requirements of the Labelling of Food Order. Brief details of the 41 County samples will be found in table 21. Of the total number of samples to which exception was taken 54 (29 County) had labels which did not disclose one or more of the following requirements ; the name and address of the packer, the true name of the food or a correct list of ingredients. In each of the above instances, the packers were communicated with and their attention drawn to the requirements of the Order. During the previous year, 1963, the number of samples which contravened the Labelling of Food Order included 52 County Samples and 27 from Autonomous Food and Drugs Authorities. In addition, 10 samples (5 County) submitted during 1964 bore either an incorrect declaration or no declaration of the net weight of the contents and in these instances either the vendors were communicated with or it was advised that the facts be brought to the notice of the Weights and Measures Inspectors concerned. The above figures do not include samples of sausage found to contain preservative without a declaration of its presence being made on the wrapper or notice—these are referred to in the section of the report dealing with sausage, etc.

In the following paragraphs reference is made to a number of the more interesting samples, in relation to their labels, submitted by County Sampling Officers and by Autonomous Food and Drugs Authorities.

Culinary Cochineal Colouring, Sample No. N.9800.

This informal sample was stated to be a synthetic product but no list of ingredients was given on the label. Upon analysis it was found to be a solution of the food permitted coal tar colour amaranth in water and glycerine. Amaranth is, of course, a synthetic colour but cochineal is a natural substance. The latter is a dried female insect, Dactylopius Coccus, which contains about 10 per cent. of the red colouring matter carminic acid, which is soluble in water, alcohol and alkaline solutions. Carmine is the aluminium lake of carminic acid and is insoluble in water but readily soluble in ammonia and alkaline solutions. The colour obtained from cochineal is a food permitted colour and is also used as a colouring for medicinal preparations. The packers were communicated with and it would appear that this sample was of very old stock, prior to 1949. Since that date the label had been twice amended at the request of other food and drugs authorities. The label at present in use describes the product as " culinary artificial cochineal colouring " and includes the appropriate list of ingredients.

Shrimp Salad, Sample No. E.3348.

The label on this informal sample stated " contains shrimps in mayonnaise, certified colour added." The sample was found upon analysis to contain approximately 16 per cent. shrimps, 25 per cent. fatty matter, it was coloured with the food permitted colouring matter Ponceau SX and it was free from preservatives. Where an ingredient of a food is made up of several constituents paragraph 4 (3) (b) of the Labelling of Food Order requires each of the constituents to be specified in its correct order in the list of ingredients. Where, however, the compound ingredient is itself subject to a standards order of composition, such as mayonnaise, then item 9 of the First Schedule to the Order permits the ingredient to be designated without stating its constituents. It follows, therefore, in regard to this particular sample that the list of ingredients should have stated the mayonnaise before shrimps or alternatively all of the constituents of the mayonnaise should have been declared in their correct position in the list in relation to the shrimp content. The importers were communicated with and it transpired that new labels were already in use. The name had been changed to " shrimp relish " and a list of ingredients given which stated all the constituents commencing with :—" Soya oil, shrimp, starch, egg yolk . ."

Canned Foods, Samples Nos. E.3457, N.1309 and N.1310.

The above three informal samples of canned foods were sold in two different shops without any label of any description being attached to the cans. The first sample, No. E.3457, was submitted as the result of a complaint and upon analysis it proved to be a can of salmon. The remaining two samples were both purchased at a supermarket from a display basket marked " mystery meals." The basket was filled with an assortment of differently shaped cans each of which was simply marked with the price. Upon analysis sample No. N.1309 was found to be a can of steak with gravy and onions containing 65 per cent. meat while sample No. N.1310 proved to be a can of beef broth. All three samples were, of course, prepacked foods and each should have been labelled in accordance with the requirements of the Labelling of Food Order. The vendor of sample No. E.3457 was cautioned and the manager of the supermarket where the other two samples were purchased was cautioned and the remainder of the unlabelled cans were withdrawn from sale. The manufacturers of sample No. N.1310 were traced by the Code markings stamped on the can and they stated that all their products were labelled before leaving the factory and they were quite unaware that any were being sold unlabelled.

Corned Beef, Samples Nos. S.5089, S.5090 and S.5091.

All three informal samples had been purchased at one shop. They bore similar labels and the cans had been packed and processed abroad and imported into this country by one firm. The first two cans bore identical code numbers but the third sample was of a different batch.

This last sample proved upon analysis to be genuine corned beef. The first sample was submitted upon complaint that upon it being opened its contents did not appear to be corned beef. The remaining two samples were purchased as a result of this complaint by the sampling officer from the shop concerned. Upon analysis both sample No. S.5089 and Sample No. S.5090 were found to consist of a liver paté which had obviously been incorrectly labelled. The importers were communicated with and they stated that this had been an experimental batch and they extremely glad that it had been traced as it was of much greater value than corned beef. The remainder of the stock of the batch concerned was returned to the importers and their representative explained what had happened to the original complainant.

Mayonnaise with Cream, Sample No. C.2847.

This informal sample was of an imported product packed in a polythene sachet which was labelled " mayonnaise mit sahne " and bore a pictorial representation of a cream carton. Upon analysis the sample was found to contain 56 per cent. of edible oil which is over twice the minimum limit of 25 per cent. laid down by the Food Standards (Salad Cream and Mayonnaise) Order 1945. This edible oil was found to contain not more than 3·8 per cent. of milk fat, corresponding to not more than 2·1 per cent. milk fat in the sample. This was not considered sufficient to justify the claim made for this product or the pictorial representation of a cream carton. The importers were communicated with and asked to delete the words " mit sahne " and the picture of a cream carton from their label but after considerable correspondence they stated that they had ceased to import this commodity.

Ice Lolly Syrup, Sample No. C.2898

This informal sample bore a list of ingredients one of which was designated by the trade name " Edifas," indicating a derivative of methyl cellulose. The expression " appropriate designation " is defined in the Labelling of Food Order in relation to an ingredient as, " . . . . being a specific and not a generic name or description, which shall indicate to a prospective purchaser the true nature of the product . . . ." It was felt that the true chemical name of the ingredient should be declared in a case such as this as there might be any number of trade names for the same chemical substance some of which might not easily be traced or identified. The packer at first took the opposite view that a trade name was more specific in that it denoted a particular brand of the substance. It was, however, pointed out that this did not necessarily indicate the true nature of the product, particularly so in this case as it was ascertained that there were two derivatives of cellulose sold under the name " Edifas " followed by different suffix letters.

Fruit Juice, Canned, Sample No. E.33

This sample bore a label which stated that the ingredients were apple juice and pineapple juice with added Vitamin C (over 100 mg.). The contents of the can were stated to be 16 fluid ounces. Upon analysis the Vitamin C content of the whole sample was found to be 160 mgms., equivalent to 10 mgms. per fluid ounce. Part VI and The Second Schedule of the Labelling of Food Order requires Vitamin C, when its presence is claimed, to be declared in terms of milligrams per ounce or fluid ounce and not, as in this instance, in terms of milligrams in the whole bulk of the commodity purchased. Furthermore, the Ministry of Food in 1945 suggested that no claim in respect of the presence of a vitamin should be made unless at least one-sixth of the daily requirement of the vitamin was present in the amount of the food that would ordinarily be consumed in one day. The normal daily requirement of vitamin C was then stated to be 30 milligrams. One sixth of this would, therefore, be contained in only half an ounce of this sample ; so that from the point of view of the amount actually present the claim with regard to the presence of vitamin C was amply justified. There was, however, a technical contravention of the requirement of the Order that the vitamin C should be declared in terms of milligrams per fluid ounce. The manufacturers were communicated with and correct labels are now in use.

Sauce, Sample Nos. E.4410 and E.4523

These were informal and formal samples respectively of the same brand of a thick mixed fruit sauce which bore no declaration of the presence of preservatives but upon analysis they were found to contain 240 and 225 parts of sulphite preservative, expressed as sulphur dioxide, per million parts of the samples respectively. Schedule I of the Preservatives in Food Regulations, 1962, limits the amount of sulphur dioxide permitted in sauces to 100 parts per million. Furthermore, even if not not more than the permitted limit is present regulation 5(1) and Schedule 3 of the Preservatives Regulations require a declaration of its presence to be given on the labels of sauces and certain other named foods. Legal proceedings were instituted against the manufacturers of the sauce under Regulations 3 (1) (a) and 8 (1) of the Preservatives Regulations in respect of the excess sulphur dioxide present and they were fined £15 and £8.2.6 costs.

Strawberry Flavoured Milk Drink, Sample No. 143/64

This informal sample submitted by an Autonomous Food and Drugs Authority bore a label which stated the ingredients to be pure pasteurised milk and fruit flavouring syrup. Upon analysis it was found to contain 2·2 per cent. milk-fat and 6·63 per cent. of milk solids-not-fat corresponding to the presence of approximately 76 per cent. of milk of minimum composition. Other ingredients included 4·4 per cent. sucrose, 2·2 per cent. dextrose and the permitted food colour Ponceau MX. Flavoured milk should, in your Analyst's opinion, contain not less than 85 per cent. of full-cream milk. There is no statutory standard of composition for fruit flavouring syrup which is not therefore exempt, under paragraphs 9 of the First Schedule to the Labelling of Food Order, from the requirement that its constituents should be declared; it also does not come within the definition of " flavouring " in the same Schedule which again means that its constituents must be declared. Although no further samples of this commodity were available the packers were communicated with both with regard to the deficiency in milk content and the unsatisfactory declaration of the ingredients.

Christmas Pudding, Samples Nos. 254 and 285

These informal samples were submitted by two Autonomous Food and Drugs Authorities but they were both of the same brand of pudding. They each bore a list of ingredients but this omitted reference to edible fat although the samples were found to contain 6·8 per cent. and 7·2 per cent. respectively. There is now no statutory standard of composition for Christmas puddings although under Commodity Control Orders during and immediately subsequent to the war they were required to contain not less than 9 per cent. of fat. It is in your Analyst's opinion undesirable that present day fat figures should fall below the figure required when ingredients were in short supply. The packers were communicated with and they agreed to amend both the label and the composition of their product.

Commodities claimed to contain Cream, Samples Nos. 10877, 91/64 and 537

These samples were submitted by different Autonomous Food and Drugs Authorities. The first sample was submitted as " Devon Cream Toffees "; the total edible fat content was found to be 15·7 per cent. but the milk fat content was not greater than 1·6 per cent. There is a Code of Practice relating to the chocolate and sugar confectionery trade which requires a minimum of 4 per cent. butter-fat in products described as butter sweets and your Analyst considers that where the presence of cream is claimed in sweets this is also only justified when at least 4 per cent. of milk-fat is present. The manufacturers concerned agreed to improve the milk fat content of their product. Informal sample No. 91/64 was of flour confectionery submitted as " pineapple creams." Upon analysis the cream filling was found to contain 33·2 per cent. of fat, of which not more than one-seventh consisted of milk-fat.

Section 47 of the Food and Drugs Act requires any substance resembling cream in a food to which a description including the word " cream " is applied to be cream and not imitation cream as in this instance. A formal sample was advised but on going to the shop in question the sampling officer found that the cakes had been re-labelled " pineapple tarts " without any reference to the word cream. The shopkeeper was interviewed with regard to the previous label. The last sample was submitted as a " jam and cream " cake. It consisted of a layer cake in which both " cream " and jam were together between the layers of cake. It was extremely difficult to separate satisfactorily the " cream " from both the jam and the cake crumb because the latter had become partially saturated with the layer ingredients. The cake crumb was found to contain 17 per cent. of fat while the impure " cream " which was separated contained 29·4 per cent. fat of which 10·7 per cent. was calculated to be from the cake crumb, leaving 18·7 per cent, due to the cream alone. Analysis further indicated that of the 18·7 per cent. fat from the " cream " only one-fifth consisted of milk-fat. The same observations apply to this sample as to number 91/64 above and a further sample was advised. It transpired, however, that the baker in question had recently been interviewed with regard to another product and had decided to amend all his labels with the result that a further sample of this cake under the same name was unobtainable.

Chicken, Canned, Sample No. 897

This informal sample consisted of an imported product which was labelled " one whole chicken without giblets, ready to serve." The ingredients in much smaller type stated " chicken, chicken broth, salt and mono sodium glutamate." The net weight of the contents was 1,458 grammes and the drained weight of the chicken was 800 grammes of which 190 grammes consisted of bone. The amount of chicken broth present, therefore, was 658 grammes or slightly more than the edible chicken. The only indication of the actual weight of chicken present was in German, presumably to comply with German regulations. The importers were communicated with and advised that this product should be called " whole chicken in chicken broth." At first they stated that they considered the label to be satisfactory as there was a whole chicken in the can and a true list of ingredients was given. It was pointed out that the Labelling of Food Order requires the usual name of the food to be given and other manufacturers of this type of product do include the word broth or stock in the name of the commodity. Furthermore, section 6 (5) of the Food and Drugs Act specifically states that a correct list of ingredients does not preclude a label from being held to be otherwise false or misleading. The importers then agreed to write to the canners with the request that future labels be amended.

Fruit Curd, Samples Nos. 10845, 10846, 909, 528 and 550

These informal samples were submitted by Autonomous Food and Drugs Authorities and they had been purchased from market stalls or shops. They all consisted of jars of lemon curd which were described as " Home Made " or were packed in such a way to suggest that they were home made. The samples were either unlabelled or bore incomplete labels from the point of view of the Labelling of Food Order and two also did not comply with the standards of composition laid down by the Food Standards (Preserves) Order, 1953. Samples No's 10845 and 10846 bore no label except that No. 10846 was described on the lid as " Home Made." Each, therefore, omitted to state the name of the food, the name and address of the packer and the declaration of net weight. Sample No. 909 bore a name and address but there was no indication of the name of the food or the net weight. The above three samples complied with the requirements of the Standards Order and were, in fact, much better in composition than is statutorily required. Sample No.528 bore no name and address of the packer and only contained 59·6 per cent. of soluble solids as against the statutory minimum of 65 per cent. This sample, however, contained much more fat, 18·7 per cent., and egg, equivalent to 6·2 per cent. dried egg, than is required by the standard ; the minimum limits of these ingredients being 4·0 per cent., and 1·0 per cent. respectively. The deficiency in soluble solids was, therefore, entirely due to a low sugar content. Sample No. 550 was from the same source as the last mentioned sample and this also omitted the name and address of the packer. The label on this sample gave a voluntary list of ingredients which stated " sugar, butter, margarine, eggs and fresh lemons." Upon analysis the soluble solids were found to be 59·6 per cent. and the total fat 21 per cent., including only 1·5 per cent. butter fat. The sample was, therefore, deficient in soluble solids and undue priority was given to butter in the list of ingredients. In respect of all five samples described above the vendors or makers were interviewed and cautioned and the appropriate Weights and Measures Inspectors were informed of the omission of a declaration of net weight on the first three samples. It transpired that samples No's 528 and 550 were made and packed on the retail premises from which they had been sold and they were, therefore, exempted by sub-paragraph 5 (3) of the Labelling of Food Order, from stating the name and address of the packer.

Full Strength Continental Chocolate Liqueurs, Sample No. 162

This informal sample of imported chocolate liqueurs was found upon analysis to contain 25 per cent. proof spirit in the sugar saturated liquid centres. The centres comprised approximately 33·5 per cent. by weight of the whole chocolates, the chocolate casings of which were lined by a layer of separated sugar. The above figures corresponded to 6·1 per cent. proof spirit on the whole chocolate and it was calculated that the sugar-free liquid used to make the liquid centres had originally contained 43 per cent. proof spirit. Sugar-free liqueurs such as liqueur brandy or liqueur whisky invariably contain appreciably more than 65 per cent. proof spirit while very few sweetened liqueurs of any description contain less than 40 per cent. proof spirit —whereas the sample under discussion only contained 25 per cent. proof spirit in the filling. On comparison with these figures it will be seen that the sample under discussion neither contained nor was originally made from a full strength liqueur or spirit. Furthermore, it is not possible to make commercially and stock for sale liqueur chocolates which contain a full strength spirit because the spirit will partially dissolve the chocolate casing and leak out. Chocolate liqueurs are made either by mixing the liqueur with sugar syrup and pouring into a chocolate shell, some of the sugar then crystallising out and preventing leakage of the liqueur or by diluting the liqueur to such an extent that its alcohol content is insufficient to attack the chocolate casing. In neither case, even if a full strength liqueur is the starting material does it exist as such in the manufactured chocolate liqueur. Earlier during the year under review a successful prosecution was taken by another authority under the Merchandise Marks Act 1887 in respect of imported liqueur chocolates to which the description " full strength spirit " had been applied yet the liquid centres only contained 15·1 per cent. proof spirit. The packers of sample No. 162 were communicated with and they agreed in future not to use the words " full strength " on their label.

Ice-Cream

Until November, 1948, there was no control in this country on the composition of ice-cream. In that month, however, the Ministry of Food decided to allocate additional supplies of sugar, and in some cases fats, to those manufacturers who undertook to include at least 2·5 per cent. fat in their ice-cream. In March, 1951, the first Statutory Standard for ice-cream was made and, except for a short period between July, 1952, and June, 1953, when a slightly reduced standard was temporarily introduced, the minimum standard then laid down was in operation until April, 1959. This standard required ice-cream to contain not less than 5 per cent. fat, 10 per cent. sugar and 7½ per cent. milk solids other than fat. There were special standards for ice-cream containing fruit and for " Parev " (kosher) ice. The required sugar content of ice-cream could be made up of certain other sugars in addition to sucrose but no ice-cream was permitted to contain less than 7½ per cent. sucrose.

When the above standard was first introduced in the year 1951 the Food Standards Committee of the Ministry of Food stated that it was not an ideal standard and that it should be amended and improved as supplies of ingredients became more plentiful. It was not surprising, therefore, that a Food Standards Committee report on the ice-cream standards was published in December, 1957, and that this should be followed by the making of the Food Standards (Ice-Cream) Regulations, 1959, which came into operation on the 27th April, 1959. The standard incorporated in these regulations and which is in force today, is as follows and applies whether or not the ice-cream forms part of a composite article of food :—

> " (*a*) Ice-Cream shall contain not less than 5 per cent. fat and 7½ per cent. milk solids other than fat so, however, that where ice-cream contains any fruit, fruit pulp or fruit purée it shall either conform to the above standard or, alternatively, the total content of fat and milk solids other than fat shall be not less than 12½ per cent. of the whole including the fruit, fruit pulp or fruit purée, as the case may be, and such total content of fat and milk solids other than fat shall include not less than 7½ per cent. fat and 2 per cent. milk solids other than fat ;
>
> Provided that as respects any ice-cream sold, or offered or exposed for sale under any of the descriptions hereinafter specified or under any such other description as is calculated to lead an intending purchaser to believe that he is purchasing ice-cream of any such description as is so specified, the standard of composition shall be as follows :—
>
> > (*i*) Dairy ice-cream, dairy cream ice or cream ice shall in each case contain not less than 5 per cent. milk fat and no other fat (save as may be introduced by the use as an ingredient of any egg, any flavouring substance or any emulsifying or stabilising agent) and not less than 7½ per cent. milk solids other than fat, so, however, that where any dairy ice-cream, dairy cream ice or cream ice contains any fruit, fruit pulp or fruit purée it shall either conform to the standard of composition for that ice-cream, or alternatively, the total content of milk-fat and milk solids other than fat shall be not less than 12½ per cent. of the whole including the fruit, fruit pulp or fruit purée, as the case may be, and such total content of milk-fat and milk solids other than fat shall include not less than 7½ per cent. milk-fat and no other fat (save as may be introduced by the use as an ingredient of any egg, any flavouring substance or any emulsifying or stabilising agent) and not less than 2 per cent. milk solids other than fat.

(*ii*) Milk ice or milk ice containing any fruit, fruit pulp or fruit purée shall contain not less than 2½ per cent. milk-fat and no other fat (save as may be introduced by the use as an ingredient of any egg, any flavouring substance or any emulsifying or stabilising agent) and not less than 7 per cent. milk solids other than fat.

(*iii*) " Parev " (kosher) ice shall contain not less than 10 per cent. fat and no milk-fat or other derivative of milk.

(*b*) No ice-cream of any description shall contain any artificial sweetener.

In this Schedule—

(*a*) ' artificial sweetener ' means any chemical compound which is sweet to the taste, and the expression includes polyhydric alcohols but does not include sugar or any other carbohydrate.

(*b*) each reference to any proportion or percentage means that proportion or percentage by weight."

It will be noted that there is no minimum standard for sugar content but there is a specific prohibition to the use of artificial sweeteners. The most important change, however, was the introduction of the special standards for dairy ice-cream, dairy cream ice, cream ice and milk ice which are all required to contain specified minimum amounts of milk-fat, the use of the other types of fat not being permitted in these varieties of ice-cream.

On the same day that this standard came into operation an amendment to the Labelling of Food Order also came into force and this introduced requirements as to the labelling of ice-cream. It is illegal to label or advertise ice-cream by means of words or pictorial devices suggestive of butter, cream, milk or anything connected with the dairy interest unless the ice-cream contains no fat other than milk-fat. The label or advertisement may, however, bear a statement to the effect that the ice-cream contains skimmed milk solids. It is also an offence to sell under the description " ice-cream " any prepacked ice-cream which contains fat other than milk-fat unless the wrapper also bears in letters of a specified height either the declaration " contains non-milk-fat " or, if appropriate, the declaration " contains vegetable fat." The above requirements also apply to ice-cream which forms part of a composite article of food.

A third regulation concerning both ice-cream and certain types of ice-lollies also came into operation on the 27th April, 1959, *i.e.*, the Ice-Cream (Heat Treatment, etc.) Regulations, 1959. These regulations consolidate and amend the Ice-Cream (Heat Treatment) Regulations, 1947 to 1952. The regulations require the ingredients of ice-cream after mixing to be either pasteurised or sterilised by one or other of the following methods :—

Pateurisation

"Method I. The mixture shall be raised to and kept at a temperature of not less than 150 ° Fahrenheit for at least 30 minutes.

Method II. The mixture shall be raised to and kept at a temperature of not less than 160 ° Fahrenheit for at least 10 minutes.

Method III. The mixture shall be raised to and kept at a temperature of not less than 175 ° Fahrenheit for at least 15 seconds.

Sterilisation

The mixture shall be raised to and kept at a temperature of not less than 300 ° Fahrenheit for at least 2 seconds."

Before heat treatment the mixture shall not be kept for more than one hour at any temperature which exceeds 45 °F. and after heat-treatment it shall be cooled to not more than 45 °F. within 1½ hours and kept at this temperature until the freezing process is carried out. After freezing the ice-cream shall be kept at a temperature not exceeding 28 °F. ; if its temperature does exceed this figure it must again be heat-treated before being re-frozen.

The above requirements as to pasteurisation or sterilisation do not apply to the use of a complete cold mix reconstituted with drinking water if the mixture is made into ice-cream within one hour of reconstitution. Furthermore, the Ice-Cream (Heat-treatment, etc.) (Amendment) Regulations, 1963, also permit sugar to be added to a complete cold mix after it has been heat treated and before it is sent out by the manufacturer. The requirements also do not apply to any mixture (whether containing milk solids or not) used, either alone or with other mixtures, in the manufacture of water ice or similar products if the mixture has a pH value of 4·5 or less. It is considered that such products are sufficiently acid to prevent the growth of harmful bacteria without heat-treatment.

It will be noted from table 22 that the average fat content of ice-cream during the year under review was 8·2 per cent. and that this is below the figure recorded for the previous year although the general improvement in the fat content of ice-cream found over the last 16 years has been maintained. A perusal of the table shows that the average fat content in 1946 was only 2·3 per cent. whereas for 1964 it was 8·2 per cent. Furthermore the lowest fat content found during 1964 was 4·5 per cent. ; whereas in the four years 1946 to 1949 fats as low as 0·3 and even 0·1 per cent. were found. Table 22 shows the results for all samples of ice-cream examined in the County Laboratory whether submitted by County Sampling Officers or by Autonomous Food and Drugs Authorities.

During the year 1964, 127 samples of ice-cream (excluding samples of dairy ice-cream and milk ice) were submitted for chemical analysis, 66 by County Sampling Officers and 61 by Autonomous Food and Drugs Authorities. Of these, seven samples (all County) were reported upon adversely. In the year 1963, the number of samples reported upon adversely was five. Of the seven unsatisfactory samples six were deficient in fat, and one was deficient in milk solids other-than-fat.

Details of the seven incorrect County samples, together with the action taken, will be found in Table 21.

The average figures found for the 127 samples were—total solids 34·1 per cent. (maximum 49·7 ; minimum 24·2) and for fat content 8·2 per cent. (maximum 14·4 ; minimum 4·5). These figures as will be seen from the following table, which includes figures for the last 19 years, show that the big improvement in composition noted in the year 1950 has been maintained. It will be remembered that prior to the war a figure of eight per cent. was suggested by a trade association as a minimum standard for fat content and it is interesting to note that during the year under review, 75 samples out of the total of 127 showed fat contents varying from 8·0 to 14·4 per cent.

Table 22

Ice-Cream

YEAR	Number of Samples	Fat Content Average %	Total Solids Average %	Highest Fat %	Lowest Fat %	Highest Total Solids %	Lowest Total Solids %
1946	45	2·3	22·5	10·7	0·1	36·8	13·3
1947	59	3·0	23·6	10·6	Less than 0·1	39·2	14·1
1948	53	3·9	25·3	11·3	0·1	33·4	18·9
1949	171	6·4	29·3	13·3	0·3	45·9	14·7
1950	186	8·5	32·1	14·7	2·2	43·0	20·1
1951	230	8·6	32·6	15·6	3·3	40·7	23·0
1952	143	9·0	32·8	13·7	2·0	40·0	19·6
1953	130	8·6	32·7	15·2	2·5	42·3	23·3
1954	90	9·2	34·6	13·8	3·1	44·0	24·8
1955	95	8·1	33·2	13·3	3·5	40·9	24·3
1956	94	9·2	34·0	16·4	3·6	43·6	26·3
1957	99	8·7	33·3	14·7	3·0	41·9	22·9
1958	111	8·9	33·8	15·6	2·7	42·1	25·3
1959	104	8·9	34·6	17·4	4·6	55·2	27·4
1960	68	8·7	35·4	12·4	4·1	50·7	25·8
1961	114	9·7	35·7	14·8	4·6	50·1	27·1
1962	121	9·1	35·1	13·3	3·3	50·5	24·8
1963	95	8·5	34·1	13·8	2·7	50·4	26·0
1964	127	8·2	34·1	14·4	4·5	49·7	24·2

Dairy Ice-Cream

Eighteen samples (13 County) of dairy ice-cream, not included in the foregoing table, were also submitted for chemical analysis. The average figures found for the 18 samples were—total solids 32·0 per cent. (maximum 38·5 ; minimum 26·2) and for milk fat content 7·1 per cent. (maximum 12·9 ; minimum 2·9).

Of the eighteen samples examined four (all County) were reported upon adversely. Two samples, No's C.3386 and C.3714 contained only 4·85 and 2·95 per cent. of milk fat respectively (the minimum standard being 5·0 per cent.) and the vendors concerned were cautioned. Sample No. C.3316 had a milk solids other than fat content of only 7·1 per cent. (the minimum standard being 7·5 per cent.) and the manufacturer was interviewed. The remaining sample, No. C.3388 had a milk fat content of only 4·9 per cent. and a milk solids other than fat content of only 7·0 per cent. In this instance also, the vendor was cautioned.

Milk Ice.

Three samples of Milk Ice submitted by an Autonomous Authority during the year under review were found to be satisfactory.

ICE LOLLIES

During the year under review 29 samples of ice lollies were submitted for examination under the Food and Drugs Act. Fifteen of the samples were submitted by the County Sampling Officers, and Fourteen samples by Autonomous Food and Drugs Authorities. Unlike ice-cream there is no statutory standard for the composition of ice lollies. They are specifically excluded from the provisions of the Food Standards (Ice-Cream) Regulations while the Food Standards (Soft Drinks) Order refers only to liquid soft drinks, although ice lollies are, in general similar in composition to soft drinks. Ice lollies and ice-cream are, however, both mentioned, indirectly or directly, in the Arsenic in Food Regulations and in the Lead in Food Regulations which were published in the years 1959 and 1961 respectively. In these, maximum limits of only one part per million for lead and 0·5 part per million for arsenic (as As) are specified for both commodities (the standard of one part per million for lead in ice lollies became 0·5 part per million on the 20th April, 1964.) The limits for the majority of other foods are two parts per million and one part per million respectively. In addition to the statutory limits for lead and arsenic referred to above there are also recommended maximum limits for two other toxic metals in foods generally viz., copper 20 parts per million and zinc 50 parts per million. In view of the more stringent figures adopted for lead and arsenic in ice lollies and in ice-cream than in other foods, lower limits for copper and zinc might also be desirable for these particular types of commodities.

Of the 29 samples of ice lollies submitted two (1 County) were reported upon adversely. Sample No. C.3387 contained no ice-cream yet bore a label showing a list of ingredients appropriate to a lolly containing ice-cream. The manufacturer is now using correct labels. The other sample, which was submitted by an Autonomous Authority, contained 1·0 per cent. fat not declared in the list of ingredients on the label. In this instance also the manufacturer concerned is now using correct labels.

The total solids (sugars, etc.) in the samples ranged from as little as 3·7 per cent., to 59·3 per cent. with an average for the 29 samples of 16·5 per cent. The average total solids for the 14 samples examined in the previous year was 11·0 per cent. while the average for 25 samples analysed in 1962 was 13·6 per cent.

Sausage, Meat Paste and Fish Paste

The last of the Meat Products Orders, which was revoked on the 1st March, 1953, in addition to controlling the price and meat content of sausages also prohibited the use of certain specified offals in the preparation of sausages and other uncooked open meat products intended for human consumption. The restriction on the use of these offals was re-enacted in the Offals in Meat Products Order, 1953, but no Food Standards Regulations have been made to replace the requirements as to composition laid down in the Meat Products Orders. There is, therefore, now no statutory standard for the meat content of sausages.

The compositions of meat paste and of fish paste, however, are controlled by the Food Standards (Meat Paste) Order, 1951, and the Food Standards (Fish Paste) Order, 1951. The standard for meat paste is a minimum of 55 per cent. meat and for fish paste a minimum of 70 per cent. fish. The Standards apply to both imported and home produced products.

During the year 1964, 113 samples of sausages, six of canned sausage, one Cumberland sausage, one tomato sausage and one cooked sausage were examined as against 164 samples of sausage and eleven samples of canned sausage, etc., in the previous year. Sixty-five samples were examined for the County (including four canned sausage and one cooked sausage) while the remainder of the samples were examined for Autonomous Food and Drugs Authorities. Of the sausage samples submitted during the year under review 60 consisted of beef and 53 of pork sausage. Twenty-three County samples and twenty-one submitted by other Food and Drugs Authorities were reported upon adversely. Of these 23 contained normal amounts of preservative but without any declaration of its presence being made on the label or exhibited in the shops concerned. This is contrary to the requirements of Regulation 5 (1) and Schedule 3 of the Preservatives in Food Regulations, 1962. One sample (County) contained excess sulphite preservative, i.e. 500 parts per million (maximum limit 450 parts per million) and a small strip of chlorinated rubber, the vendor was cautioned. Nine other samples were poor in meat content and contained preservative without declaration. A further nine samples were found to be poor in meat content and of these one formal sample of beef sausage, submitted by an Autonomous Food and Drugs Authority, was the subject of a prosecution (its meat content being only 43·5 per cent.). The vendor was fined £3 with £9.2.0 costs. A sample of canned sausage (County) contained a beetle and the importers gave an assurance that they would take steps to prevent a recurrence. The remaining sample (County), submitted as the result of a complaint, consisted of cooked sausage and on examination was found to contain 14 small fragments of stone adhering to the outside of one of the pieces of sausage. Both the vendor and complainant were informed.

It is interesting to note that the average meat content of the 60 samples of beef sausage examined in the County Laboratory during the year 1964 was 57·6 per cent. while the average meat content of the 53 samples of pork sausage examined over the same period was 68·6 per cent. Bearing in mind that the standards before the 1st March, 1953, under the Commodity Control Order, were a minimum of 50 per cent. meat for beef sausage and beef sausage meat and a minimum of 65 per cent. meat for pork sausage and pork sausage meat, the average figures obtained in the County Laboratory during the year 1964, can be regarded as satisfactory. The average meat contents for beef and pork sausages shown above are similar to those obtained in the year 1963 when the average meat content of 66 samples of beef sausage was 59·7 per cent. and for 98 samples of pork sausage 68·0 per cent. Twelve of the 53 samples of pork sausage (or 22·6 per cent.) examined during the year under review were poor in meat content and nine of these were County samples. From a perusal of table 21 it will be seen that of the 9 unsatisfactory County samples of pork sausage four might be regarded as only slightly low in meat in that they had meat contents between 61·0 to 64·0 per cent. With regard to the samples of beef sausage only six were found to have meat contents below 50·0 per cent., one only of these being a County sample which contained 49 per cent. meat. Although the number of pork sausage samples found to be poor in meat content cannot be regarded as satisfactory it must be emphasised that it should not be assumed that the position with regard to pork sausage has deteriorated since control was removed at the beginning of the year 1953. Approximately forty-five per cent. of the pork sausage samples submitted by the County in the year 1952 were reported upon adversely in respect of their meat contents but the proportions of samples similarly unsatisfactory in the years, 1959, 1960, 1961, 1962 and 1963 were 20 per cent., 16 per cent., 21 per cent., 15 per cent. and 16 per cent., respectively. Details of all the unsatisfactory County samples for the year under review together with the action taken, will be found in table 21.

Twenty-six samples of meat paste (21 submitted by County Sampling Officers and five by Autonomous Authorities) were examined during the year and all were found to be satisfactory.

With regard to Fish Paste, 26 samples (19 County) were submitted for examination during the year and only one of these, from an Autonomous Authority, was reported upon adversely. This last was a formal sample of salmon paste which was found to contain only 46·5 per cent. of fish as compared with the statutory minimum requirement of 70 per cent. The manufacturer concerned was fined £20.

SAMPLES CONTAINING EXTRANEOUS MATTER

During the year under review 86 Food and Drugs Act samples (54 County) were reported upon adversely because they were found upon examination to contain extraneous matter. The corresponding number in the year 1963 was 92 samples (67 County) so that there has been a slight decrease in this type of sample, the majority of which are submitted as the result of complaints made by members of the general public. In addition to the Food and Drugs Act samples, a further 3 samples (1 County) found to contain extraneous matter were submitted under the heading of miscellaneous samples and are mentioned in Part VI of this report. Of the 86 Food and Drugs Act samples, 12 (2 County) were samples of milk, the remainder consisting of various types of foods. The wide range of extraneous matter found in the samples included :—broken glass, stones, clay, sand, mineral oil, carbonised dough, iron oxide, iron turnings, iron rivet, iron nail, rubber, cardboard, felting, paper, paper pulp, sugar cane debris, cigarette, fungus, traces of phenols, brush fibres, wood shavings, bovine skin and hair, plastic disc, piece of chlorinated rubber, paraffin, weed seeds, blood, blood vessel, lymph nodule, nerve fibre, dog hair, rodent excrement, bird dropping, mouse, dung (in milk), sodium chlorate (in milk), jute fibres, chewing gum, heather (in milk), fragments of cooked meat (in milk), marking chalk and over-heated dried milk particles. Brief details of six samples (4 County) which were the subject of legal proceedings are given below.

Kidney Soup, Sample No. S.4331

This sample submitted on complaint consisted of an opened can of kidney soup which was only approximately one-fifth full when submitted for analysis. Submerged in the contents of the can there was what at first sight appeared to be a hairy object but which, after removing from the soup and cleaning up, was found to be a piece of multi-coloured felting approximately 4½ inches long and weighing 35 milligrams when dry. The felting was reinforced with colourless rayon fibre twisted thread which was surrounded by a mass of vegetable fibres of the nature of jute in which were entangled wool and other animal fibres dyed various colours including yellow, green, blue, red and brown. It was not possible to prove by analysis that the felting was in the can at the time of processing but the complainant was very definite that it was present in the can when it was opened. Legal proceedings were instituted directly against the packers under Section 2 and 113 (3) of the Food and Drugs Act. At the hearing they pleaded " guilty," although they were at a loss to explain the presence of the felting, and they were fined £5.0.0 together with £7.7.0 costs.

Bread, Sample No. E.3444

This sample consisted of part of a small white unsliced loaf together with one slice, weighing in all 6 ounces. Embedded in the crumb of the cut surface of the larger piece of bread and near the base of the loaf was part of a tobacco cigarette. This had been cut through obliquely in slicing the loaf and a further piece of the cigarette was found embedded in a corresponding position in the one cut slice comprising part of the sample. The pieces of cigarette were firmly attached to the crumb of the loaf and when removed were found to comprise a partially smoked cigarette measuring approximately 1¼ inches long and weighing 0·61 gramme. No printing was present on the paper of the cigarette. In this instance also legal proceedings were instituted directly against the bakers concerned under sections 2 and 113 (3) of the Food and Drugs Act. At the hearing of the case they pleaded " guilty " and were fined £10.0.0 and £9.9.0 costs.

Cake, Sample No. C.2653

This sample, submitted on complaint, consisted of five slices of cake which appeared to have originally formed one oblong cake measuring approximately 4½ inches by 3 inches. The cake was of the nature of a wine cake or Russian cake and was made up of several layers, the middle of the cake consisting of an inch deep layer of pieces of yellow coloured sponge mixed with a red coloured preserve. A considerable proportion of this middle layer was found to be discoloured dark green with a mould of the penicillium genus. All five pieces of the cake were affected and the mould was not only on the cut surfaces but was also present inside the slices. No discolouration was apparent on the original external surfaces of the cake. The sample as submitted was reported, in the opinion of your analyst, to be unsuitable for human consumption. It transpired that the cake had been made at a bakery which supplied the shop in question at frequent intervals but a code number on the wrapper of the cake indicated that it had been made a month before the day of retail sale. Legal proceedings were instituted under Section 2 of the Food and Drugs Act against the company owning the retail confectioners shop from which the cake had been purchased and at the hearing of the case the firm pleaded " guilty " and was fined £5.5.0 and £9.9.0 costs.

Bread, Sample No. E.457

This sample consisted of two slices of bread one of which had been " buttered." The slices appeared to be consecutive slices from a loaf and a dark coloured object was embedded near the centre of the slices and had been sliced through longitudinally in slicing the bread. On examination this object was found to weigh 65 milligrams of which 58 milligrams had been firmly embedded in the crumb of the " unbuttered " slice, the remainder being in a corresponding position in the " unbuttered " side of the " buttered " slice. Upon microscopical and chemical examination this foreign matter proved to be a pellet of rodent excrement measuring approximately 11 by 4 millimetres and which was devoid of phosphatase. This last fact coupled with the manner in which it was embedded in the crumb of the bread indicated that it was present in the bread before it was baked. Legal proceedings were instituted against the bakery firm concerned and they were fined £15.0.0 together with £9.17.0 costs.

Milk, Sample No. 194

This sample submitted by an Autonomous Food and Drugs Authority as the result of a complaint consisted of a one-third pint bottle of school milk. The bottle was practically full when received at the laboratory but the metal foil cap had been removed. A dark coloured almost black substance was attached loosely to the inside of the neck of the bottle just above the surface of the milk and another similar but smaller piece of foreign matter was loose at the bottom of the milk together with a little finely divided debris. The whole of this dark coloured material when separated weighed 10 milligrams. Upon microscopical examination it was found to consist mainly of partially digested vegetable cellular matter including fragments of seed-coats similar to those of the weed corn spurrey (Caryophyllaceae). The opinion was expressed that the foreign matter had been derived from a bird dropping. Legal proceedings were instituted against the dairy concerned and the defendants were fined £10.0.0 together with £5.5.0 costs.

Bread, Sample No. 674

This sample was also submitted by an Autonomous Food and Drugs Authority and it consisted of approximately half of a large unsliced loaf of bread together with part of a slice of the bread. A dark coloured object was visible in the centre of the cut surface of the part loaf which after removal was identified as part of the body of a mouse. This had been embedded in the crumb of the loaf to a depth of 1½ inches from the cut surface and ten mouse hairs were also found embedded in a corresponding position in the part slice of bread. The part mouse weighed 2·4 grammes and both this and the bread were in a dried-out condition and were affected with mould growth when submitted to the laboratory. Legal proceedings were instituted against the vendor under section 8 of the Food and Drugs Act who in turn laid an information under section 113 (1) against the firm of bakers concerned. At the hearing of the case the latter were fined £10 together with £7.17.6 costs.

Samples Containing Insects or Insect Remains

Twenty-seven Food and Drugs Act samples (25 County) were found to contain insects or insect remains during the year under review. This number is very similar to that obtained during the year 1963 when 24 samples (22 County) were found to contain insects. In addition, five samples (1 County) were submitted during the year under review as miscellaneous samples and are mentioned in Part VI of this report. The insects found in the samples included five species of beetles, meal mites (Tyroglyphus Farinae), book lice (Psocoptera), moths, slugs, house fly, blow fly, unidentified small flies or gnats and parts of flies, unidentified fly larvae, fruit fly pupae, ant, wasp, honey bees, earwig, cockroach and grain weevil. Brief details of 24 of the County samples will be found in table 21. The remaining unsatisfactory County sample consisted of a half-pint bottle of milk which was found to contain a dead earwig and the dairy concerned was cautioned. In the following paragraphs mention is made of four County samples which resulted in prosecutions.

Rice, Sample No. E.3411

This informal sample consisted of an opened 1lb. size carton of rice which was submitted as the result of a complaint by the purchaser. Upon analysis it was found to contain 3·7 grammes of buff coloured powdery material which upon microscopical examination was seen to consist almost entirely of the excreta and the remains of the bodies of mites together with some live mites. Approximately 20 per cent. of the rice grains in the almost full carton showed evidence of being badly damaged by mites. The remains of approximately 400,000 bodies of mites (Tyroglyphus farinae) together with 40 live mites were present in the buff coloured powder separated from the sample. The moisture content of the sample was 14·5 per cent. which was higher than the normal figure of 12 to 13 per cent. but was not as high as might be expected where there was heavy infestation by mites. This, combined with the fact that most of the mites were dead, would suggest that the carton in the past had been stored under damp humid conditions favouring the development of mites and that it had more recently been kept under dry conditions. It was found that the shop concerned had a separate storeroom and it was possible for the carton to have been stored there for a very considerable period before it was placed in the shop. Legal proceedings were instituted against the firm of retail shopkeepers under section 2 of the Food and Drugs Act and they in turn laid an information against the wholesaler concerned under section 113 (1) of the Act. Both defendants pleaded " not guilty " and after a full hearing the wholesalers were dismissed from the proceedings. The retail firm was fined £5.0.0 together with £17.14.6 costs which figure included £6.6.0 costs awarded to the wholesalers.

Portion of a Meal, Sample No. E.3574

This sample consisted of part of a meal which included a meat pie, broken into two pieces, a cornish pasty, broken into three pieces and some chipped potatoes. The filling of the Cornish pasty included meat, potatoes and onion, wheras the pie contained only meat and cereal filler. A dead cockroach, entire except for part of one leg was found loose amongst the food but fragments attached firmly to the cockroach consisted of meat and heated potato starch which was consistent with the cockroach having been present inside the cornish pasty. Further examination of the filling of the Cornish pasty resulted in a Golden Spider Beetle (Niptus hololeucus) measuring 4 millimetres long and a beetle larva 5 millimetres long being found. Both the cockroach and the beetle gave negative results by the phosphatase test which indicated, together with the result of the microscopical examination of the cockroach, that they were present in the Cornish pasty before it was baked. Legal proceedings were instituted against the bakers concerned who pleaded guilty and were fined £25.0.0 together with £7.15.0 costs.

Mixed Cereal, Sample No. C.3596

This sample consisted of an opened 8 oz. packet of mixed cereal and separately a live moth. The cereal consisted of precooked wheat, oats and barley together with other ingredients including skim milk powder. The packet consisted of a carton with a paper bag liner. Upon examination 2·9 grammes of insect webbing and excreta with adhering cereal matter, together with another live moth, two dead moths, seven empty moth pupa cases and seven moth larvae (six alive) were found. The sample contained webbing and insects throughout its bulk but mainly adjacent to the paper bag. This last contained 26 holes of average diameter 1·5 millimetres and one of the pupa cases with its cocoon was attached to the outside of the paper bag. The moths were identified as the case-bearing clothes moth (Tinea pellionella) and they were approximately 11 millimetres long. This moth is cosmopolitan and usually infests wollen materials, hair, fur, etc., and it is quite possible that the skim milk powder, present as an ingredient in this sample, had been an incentive to the infestation. Legal proceedings were instituted against the retailers under section 2 of the Food and Drugs Act. After a full hearing the defendants were given an absolute discharge but were required to pay £18.5.0 costs.

Part of a Butter Pie, Sample No. N.1654

This sample submitted as the result of a complaint, weighed three and one-quarter ounces and consisted of the greater part of the crust and a small amount (one-third of an ounce) of the chopped potato filling of a pie which had originally measured approximately 4 inches in diameter by 1·5 inches in depth. The name " butter pie " is apparently given locally to a pie with a potato filling, which latter, however was found to contain only 1·1 per cent of total fat and no butterfat. The subject of the complaint was found to be a dead house fly which was partially embedded in the potato filling at a point adjacent to the top crust and near the side of the pie. The result of the phosphatase test on the fly and its position in the filling were consistent with it having been present in the pie before it was baked. Legal proceedings were instituted against the retail confectioner and baker concerned who pleaded " Guilty " at the hearing of the case and he was fined £5.0.0 together with £7.15.0 costs.

DRUGS

During the year under review 596 samples (513 County) of drugs were submitted for examination as compared with 555 samples (470 County) during the year 1963. The samples mainly comprised articles which are the subject of monographs in the British Pharmacopoeia or the British Pharmaceutical Codex but also included a number of proprietary drugs and four samples of herbal remedies. They, therefore, included such substances as olive oil, almond oil, gelatine and malt extract with cod liver oil which can also be regarded as foods as well as a relatively large number of traditional drugs such as aspirin tablets, seidlitz powders, tincture of iodine, etc. Some 177 of the samples (138 County) consisted of modern official or proprietary drugs ; for example, penicillin preparations, Fentazin tablets, Nardil tablets, etc. During the year under review 22 samples (18 County) were reported upon adversely. The majority of the unsatisfactory samples consisted of traditional drugs but they did include seven modern official or proprietary drugs of which six were County samples. All the samples of drugs examined for the County during the year under review are listed alphabetically with other samples in table 3 and particular attention is directed to the list of proprietary drugs given on page 25. Brief mention is made in the following paragraphs to each of the samples which were reported upon adversely. It will be seen that in some cases the compositions of the samples were seriously at fault, in others the labels were incorrect while in one instance there was only a slight discrepancy in the number of tablets supplied.

Children's Soluble Aspirin Tablets, Sample No. C.3976

This informal sample of 1¼ grains soluble aspirin tablets, as compared with the normal 5 grain tablet of the British Pharmacopoeia, was found upon analysis to contain three times the amount of free salicylic acid, based on the aspirin content of the tablets, permitted by the B.P. limit test. The amount of free salicylic acid in aspirin tablets tends to increase on storage particularly if stored under damp conditions. It transpired that the stock in question was at least ten months old and could possibly have been 18 months old. The tablets in question were withdrawn from sale and returned to the manufacturer.

Borax, Sample No. N.653

This informal sample, sold loose, was simply labelled " borax " without any disclaimer as to quality but was found upon analysis to contain 30 parts per million of arsenic which is 26 parts per million in excess of the B.P. maximum limit of 4 parts per million for borax of medicinal quality. This sample was borax of commerical quality which may, of course, be used for general domestic purposes including laundry work or as a soldering flux but which is not intended for medicinal use. Since the 1948 edition there has been no dose given in the B.P. for borax because both it and boric acid are known to have a cumulative toxic effect. In order to prevent, however, any possibility of a mistake, particularly with commerical borax, it was advised that this commodity should be labelled " household borax " and " not for internal use." The pharmacist agreed to do this and correct labels are now in use.

Camphorated Oil, Samples Nos. C.3474 and C.3557

These two informal samples purchased from different retail pharmacies were found upon analysis to contain only 17·7 per cent. and 18·2 per cent. of camphor respectively. The limits prescribed by the B.P. for camphor content are 19·0 to 21·0 per cent. Both vendors were communicated with. In the case of sample No. C.3474 the suppliers replaced the whole of the stock while in the case of the other sample no more bottles of this particular pack existed.

Comfrey, Samples Nos. E.3570 and E.3571

These samples of the herb comfrey (Symphytum Officinale L) also known as knitbone were submitted for analysis as the result of a complaint that part of the first sample had produced unusual symptoms on taking an infusion of it. These symptoms included hoarseness and difficulty in swallowing, excitement, dizziness and some effect on vision. The complaint sample had been purchased at a retail shop and temperance bar and the second sample was obtained by the sampling officer from the stock remaining in the shop. Upon chemical analysis the samples were found to contain alkaloids of Belladonna (atropine, hyoscyamine and hyoscine) 0·115 per cent. and 0·082 per cent. respectively corresponding to the presence of 38 per cent. and 27 per cent. respectively of Belladonna herb (Atropa belladonna L.) This latter is, of course, also known as Deadly Nightshade. Microscopical examination of both samples confirmed the presence of considerable proportions of belladonna leaves and some belladonna seeds. About the same time that these samples were examined another food and drugs authority wrote to say that, following apparent symptoms of atropine poisoning in one of his patients being noted by a doctor, a sample of comfrey had been reported to contain Belladonna herb by their public analyst. Two separate wholesale firms had supplied the two retail shops concerned with comfrey but both wholesalers had obtained their supplies from one importer. The importers stated that the comfrey had been obtained from a country in Eastern Europe. All three firms concerned, i.e. the two wholesalers and the importers, gave an undertaking to have all suspect stocks withdrawn from sale.

Incidentally, the maximum B.P. dose of the dry extract of Belladonna herb contains 0·6 milligram of alkaloids while an infusion containing the extract from one gramme of sample No. E.3570 would contain 1·1 milligrams of alkaloids—an amount quite capable of giving rise to symptoms of atropine poisoning but not an amount likely to be dangerous.

Cough Medicines, Samples Nos. C.3181 and C.4097

These were informal prepacked samples of two preparations sold by different shops. Sample No. C.3181 was an " All Fours " cough mixture sold by a pharmacy, the declared formula on the label of which included Tinct. Camph. Co. B.P. 3·21 per cent. and Tinct. Opii B.P. 0·46 per cent. These ingredients should correspond to the presence of 0·006 per cent. morphine but 0·015 per cent was found upon analysis. The pharmacist concerned was communicated with and it transpired that this product had been dispensed and packed by him and he stated that precautions would be taken in future to prevent any recurrence of this discrepancy. Incidentally, preparations containing less than 0·2 per cent. morphine may be supplied by a pharmacist without special restrictions on their sale. Sample No. C.4097 was a children's cough linctus which was found to be coloured with the synthetic coal-tar colour Azorubrum (Bordeaux B). This colour was included in the B.P.C. 1949 and was used to colour compound Glycerin of Thymol. It was not, however, included in the Colouring Matter in Food Regulations, 1957, as a permitted colour in foods and was deleted from the B.P.C. in 1954. It is obviously not advisable that a colour prohibited in food should be used in medicines and the manufacturers were communicated with. It transpired that the use of this colour was discontinued about the time of the making of the Colouring Matter in Food Regulations referred to above so that this particular bottle of cough linctus must have been several years old.

Glycerin, Sample No. C.3869

This informal sample was labelled Glycerin B.P. Upon analysis, however, it was found that both the refractive index and the weight per ml. of the sample at 20 °C. were both outside the B.P. limits and the latter corresponded to a glycerin content of 97·7 per cent. The B.P. stipulates that the glycerin content should be between 98·0 to 100·0 per cent. There was a slight excess, therefore, of 0·3 per cent. water in this sample. Glycerin is a hygroscopic substance and will absorb water particularly when stored in small quantities and in bottles which are frequently opened. No action was taken in regard to this slight discrepancy.

Tincture of Iodine, Sample No. S.5219

This informal sample was found upon analysis to contain 2·77 per cent. w/v of iodine and 2·84 per cent. w/v Potassium Iodide. The B.P. limits for both of these constituents are 2·4 to 2·7 per cent. w/v. There was therefore a small excess of both constituents and the attention of the vendor was drawn to the discrepancies.

Benzylpenicillin Tablets B.P., Sample No. C.2262

This informal sample was purchased on prescription. When the strength of the tablet is not stated the B.P. directs that tablets containing 125 milligrams of Benzylpenicillin shall be dispensed. 125 milligrams of Benzylpenicillin is approximately equivalent to 200,000 units of penicillin. Upon analysis however it was found that the tablets were 125 milligrams Phenoxymethylpenicillin Potassium salt tablets. Benzylpenicillin is also known as Penicillin G while Phenoxymethylpenicillin is Penicillin V. Both tablets have similar antibacterial action but Phenoxymethylpenicillin is more resistant to inactivation by gastric juices and therefore builds up to a higher level in the blood than when a corresponding oral dose of benzylpenicillin is taken. The nature of the tablets which comprised this sample was established by determining the light absorption of a solution at 263 mu and 280 mu (For Benzylpenicillin) and then at 268 mu, 272 mu and 274 mu (for Phenoxymethylpenicillin); the sample was found to comply with the B.P. requirements for the latter and had absorptions at 263 and 280 mu which were not characteristic of benzylpenicillin. The pharmacist concerned was communicated with in regard to this mistake in dispensing and he stated that he had been confused between the suffix letters G and V applied to these two different forms of penicillin.

Proprietary Sulphonamide Suspension, Samples Nos. N.9901 and E.105

These informal samples of the same brand of sulphonamide suspension purchased at different pharmacies should have contained in each teaspoonful (5 mls.) a total of 500 milligrams of a mixture of sulphacetamide, sulphadiazine and sulphamerazine. They were actually found to contain only 183 milligrams and 113 milligrams respectively. Two other samples purchased from two other pharmacies during the year under review were found to be correct. The deficiencies found could have been due to either inadequate mixing, separation of contents during storage or to incorrect formulation. The pharmacists from whom the incorrect samples were obtained were communicated with and the remainder of their stocks were withdrawn from sale.

Proprietary Phenoxymethylpenicillin Suspension, Sample No. E.4013

This informal sample of a brand of Penicillin V suspension obtained on prescription should have contained 125 milligrams of Phenoxymethylpenicillin Potassium salt in one teaspoonful (5 mls.). Upon analysis, however, it was found to contain only 59·6 milligrams of phenoxymethylpenicillin potassium in 5 mls. It is possible that another similar proprietary preparation which, however, is stated to contain only 62·5 milligrams of Penicillin V potassium had been dispensed in error. The pharmacist concerned was communicated with and he stated that the discrepancy was, in fact, due to a dispensing error and not to any inconsistency in the proprietary medicine requested on the prescription.

Proprietary Travel-sickness Tablets, Sample No. E.310

This informal sample purchased over the counter at a branch shop of a firm of pharmacists should have been labelled either with the word “ Poison ” or with the special cautionary wording required by Schedule 7 (9) of the Poisons Rules 1964. The wording for certain substances intended solely, and made up ready, for the prevention of motion sickness is " Caution. This may cause drowsiness." The ommision of the appropriate wording was brought to the notice of the firm concerned.

Seidlitz Powders, Samples Nos. N. 131 and C.2363

Prior to the year 1958 there was a seidlitz Powder official in the B.P. and prior to 1963 there was a double strength seidlitz powder and an extra strong seidlitz powder listed in the B.P.C. These powders had the following composition :—

	Blue Paper		*White Paper*
	Sodium Bicarbonate	*Sodium Potassium Tartrate*	*Tartaric Acid*
Seidlitz Powder	2·5 gms.	7·5 gms.	2·5 gms.
Double Strength Seidlitz Powder	2·5 gms.	15·0 gms.	2·5 gms.
Extra-strong Seidlitz Powder	2·5 gms.	11·25 gms.	2·5 gms.

There is now no seidlitz powder in the B.P. and the 1963 edition of the B.P.C., which came into force on the 1st January, 1964, lists only a seidlitz powder and a double-strength seidlitz powder of the above composition. Sample No. N. 131 consisted of a double strength seidlitz powder B.P.C. and it was found that the contents of the Blue paper weighed only 16·35 gms. The B.P.C. prescribes that the contents of the blue paper shall weigh between 16·6 to 18·4 gms. Sample No. C.2363 was purchased early in February, 1964, and was labelled extra strong seidlitz powder B.P.C. A powder of this description was then no longer listed in the B.P.C. The manufacturers of both these powders were communicated with in regard to the relatively slight irregularities found.

Zinc Ointment B.P., Sample No. C.3481

This informal prepacked sample was found upon analysis to contain 22·9 per cent. of zinc oxide. The British Pharmacopoeia requires zinc ointment to contain 15 per cent. (limits 14·0 to 16·0 per cent.) of zinc oxide in simple ointment. The manufacturers were informed of the discrepancy found and they obtained the remainder of the vendor's stock which they examined and confirmed that it showed variations in composition. The zinc ointment was made in bulk and transferred mechanically to tins and it would appear that there is a possibility of some deposition of zinc oxide during the filling process if the ointment is allowed to get too warm.

Indian Brandee, Sample No. 10724

This informal prepacked sample submitted by an Autonomous Food and Drugs Authority bore a label which stated the active constituents to be :—Spt.Aeth. Nit. 4·5 per cent., Tr. Rhei. Co. 4·5 per cent., Tr. Capsici 0·5 per cent and Tr. Zingib. Fort. 1·0 per cent. Upon analysis, however, the content of ethyl nitrite was found to correspond to not more than 1·8 per cent. of spirit of nitrous ether. This last mentioned substance is very liable to decomposition unless protected from light and moisture in well-filled and well-closed containers. Spirit of nitrous ether has been deleted from the B.P.C. 1963 but in the previous edition the limits for the ethyl nitrite content, because of its liability to decomposition, were quite wide, i.e. 1·25 to 2·50 per cent. It will be apparent that in a mixture of the nature of the sample under discussion, which contains moisture, sugar and other organic substances there will be an even greater tendency for decomposition. No action was advised in respect of this sample.

Parrish's Chemical Food, Sample No. 12/64

This informal sample submitted by an Autonomous Food and Drugs Authority was found to be correct in its total iron and calcium contents. The total iron being 0·45 per cent. w/v but only 0·2 per cent. w/v was soluble. Parrish's chemical food should be a clear liquid but this sample had a dark brown colour instead of the usual red colour and contained a deposit of iron compounds. It had all the appearances of old stock and it is known that, particularly under unsatisfactory storage conditions, the soluble ferrous phosphate may become at least partially oxidised to insoluble iron compounds. The remainder of this stock was withdrawn from sale and the cause of its unsatisfactory condition was investigated by the manufacturer.

Proprietary Antacid Tablets, Sample No. 23

This informal sample of prepacked antacid tablets was submitted in a carton which declared the contents to be, 30 tablets. The tablets were stated to contain aluminium glycinate and magnesium carbonate and their composition was found to be correct. The carton, however, was found to contain only 29 tablets. This slight discrepancy was brought to the notice of the packers.

Saccharin Tablets, Sample No. 214

This informal sample was submitted as the result of a complaint to an Autonomous Food and Drugs Authority. It was alleged that after the cardboard drum of 1,000 tablets has been in use for a month or so many of the remaining tablets were seen to have developed brown spots. The saccharin content of the tablets was found to be normal and the brown specks present on many of the tablets were seen to be surface contamination only. This contamination was found to be in the form of raised specks which appeared sticky and which dissolved readily and completely in water. A slight taste resembling that of coffee was noted. The complainant was interviewed and it transpired that she was in the habit of pouring a number of the tablets into the palm of one hand and then selecting the number required to drop into her coffee which she made from a coffee extract powder ; the remaining tablets were then returned to the drum. There is no doubt that the complainant herself had accidentally caused the contamination of the tablets.

PROSECUTIONS

When the adulteration of a sample is considered to be sufficiently serious, legal proceedings are instituted. Prosecution, however, is only one of the means of dealing with adulterated or otherwise unsatisfactory samples. A perusal of tables 10 and 21, which are concerned with the various types of milk adulteration and sophisticated samples other than milk, respectively, shows that many of the samples are only slightly adulterated. In the case of food and drug samples, other than milk, deterioration may be due to long storage or adulteration may be brought about by the action of some person other than the actual vendor. In these instances it is often considered appropriate to take less drastic action than legal proceedings. In the case of milk samples vendors are sometimes cautioned and subsequent samples then frequently prove to be genuine ; in other instances dairies are visited by the Sampling Officers in order to correct faulty dairy management which has given rise to unsatisfactory samples. In the case of other foods and drugs appropriate action may take the form of the surrender for destruction of the remainder of any unsatisfactory stocks, returning stocks to manufacturers or communicating with packers with regard to unsatisfactory labels, etc.

During the year a total of 562 County food and drugs samples were reported upon adversely and in respect of 32 of these prosecutions were instituted. Eighteen of these samples consisted of milk which were found to contain extraneous water or to be deficient in fat. As regards other types of samples, three contained extraneous matter, four contained insects, one Gin contained excess water, one Sauce had excess Sulphur Dioxide, one Mixed Cut Peel was deficient in soluble solids, one Cake was infested with mould and one Peeled Shrimps (canned) contained Benzoic Acid. In addition, of two samples of Channel Islands Milk which were the subject of prosecutions, one was found to contain extraneous water and the other was deficient in fat. There were 32 convictions or orders to pay costs. The total fines and costs during the year amounted to £474.2.0. In table 23 will be found similar information for the years 1912 to 1964 inclusive.

Table 23

County Fines and Costs during the Years 1912-1964

YEAR	Number of Prosecutions	Convicted or ordered to pay costs	Dismissals, etc.	Fines and Costs £	s.	d.
1912–1935 ...	1,504	1,302	202	6,239	1	7
1936	22	20	2	107	14	9
1937	39	36	3	165	1	0
1938	26	24	2	132	10	1
1939	19	18	1	100	11	6
1940	25	23	2	171	14	0
1941	84	79	5	824	13	2
1942	38	36	2	502	4	10
1943	54	49	5	375	10	11
1944	38	37	1	291	19	6
1945	33	33	0	365	4	6
1946	94	92	2	936	7	9
1947	98	93	5	667	7	0
1948	70	69	1	703	0	6
1949	48	45	3	518	17	2
1950	43	42	1	405	8	7
1951	50	39	11	362	11	6
1952	65	64	1	620	13	0
1953	54	53	1	576	12	8
1954	45	45	0	294	9	6
1955	42	41	1	261	7	6
1956	20	19	1	185	13	6
1957	21	18	3	371	1	0
1958	27	26	1	270	4	7
1959	17	17	0	279	13	0
1960	16	16	0	232	14	0
1961	30	30	0	350	5	2
1962	32	32	0	363	16	0
1963	28	28	0	494	16	9
1964	32	32	0	474	2	0
Total ...	2,704	2,458	256	17,645	7	0

Table 24

Prosecutions arising out of samples obtained during the year 1964.

District	Number of Prosecutions	Convicted or ordered to pay costs	Dismissals, etc.	Fines and Costs £ s. d.
Atherton U.D.C.	1	1	—	9 4 0
Audenshaw U.D.C. ...	1	1	—	17 15 0
Clayton-le-Moors U.D.C.	2	2	—	32 19 0
Denton U.D.C.	3	3	—	54 19 0
Fulwood U.D.C.	1	1	—	12 15 0
Fylde R.D.C.	10	10	—	57 15 0
Garstang R.D.C.	3	3	—	20 10 0
Haslingden Borough ...	1	1	—	42 17 0
Heywood Borough ...	1	1	—	16 8 6
Kirkby U.D.C.	1	1	—	12 7 0
Lancaster R.D.C. ...	1	1	—	8 3 0
Littleborough U.D.C. ...	2	2	—	55 17 6
Prescot U.D.C. ...	1	1	—	24 17 0
Prestwich Borough ...	1	1	—	19 0 0
Ulverston U.D.C. ...	2	2	—	65 10 0
West Lancs R.D.C. ...	1	1	—	23 5 0
County Districts ...	32	32	—	474 2 0
Autonomous Authorities	9	9	—	112 2 6
Total All Sources ...	41	41	—	586 4 6

PART II.

THE MILK (SPECIAL DESIGNATION) REGULATIONS, 1960, AND THE MILK (SPECIAL DESIGNATION) REGULATIONS, 1963

Phosphatase Test, Half-hour Methylene Blue Test and Turbidity Test

The above Regulations were made jointly by the Minister of Health and the Minister of Agriculture, Fisheries and Food. The Special Designations permitted prior to the year under review were, for raw milk, " Tuberculin Tested " and, for heat-treated milk, " Pasteurised," " Sterilised " and " Tuberculin Tested Milk (Pasteurised)." The 1963 Regulations permitted a licence holder authorised to use the special designation " Pasteurised " to also use until the 31st December, 1964, the special designation " Tuberculin Tested Milk (Pasteurised)." The new regulations also replaced, from the 1st October, 1964, the special designation " Tuberculin Tested " by the special designation " Untreated " but the former designation was permitted, as an alternative, on containers until the 31st December, 1964.

All producers' licences are granted by the Minister of Agriculture, Fisheries and Food but since the 1st January, 1961, all dealers' licences to sell milk, or heat-treated milk have, subject to certain exceptions, been granted by Food and Drugs Authorities.

The tests described in the Regulations are :—

The Clot-on-Boiling test for Tuberculin Tested Milk. This test applied to tuberculin tested milk in the possession of the licensed producer and, therefore, only related to samples taken by the Ministry. It was designed to show whether methods of production were satisfactory throughout the year and it indicated the end of the life of the milk whether due to souring or sweet-curdling. From the 1st June, 1964, this test was replaced by the Methylene Blue Test described in the next paragraph.

The Methylene Blue Test for Tuberculin Tested Milk (obtained from a dealer), for Pasteurised Milk and, from 1st October, 1964, for Untreated milk. This test indicates the probable quality of the milk at the time of its use by the consumer and it depends on the decolorisation of methylene blue by bacteria and reducing substances present in the milk. It is a half-hour test for all the above types of milk, whereas previously raw tuberculin tested milk was submitted to a $4\frac{1}{2}$ hour or

5½ hour test depending on the time of year. The test is similar, but the conditions are more stringent, to the half-hour methylene blue test applied under earlier regulations to pasteurised milk. The test is designed to ensure that milk will keep fresh, if kept reasonably cool, until the next day's supply is received by the consumer. With this end in view samples taken from 1st May to 31st October are kept at atmospheric shade temperature until 9.30 a.m. the following day. Samples taken from 1st November to 30th April inclusive are kept at atmospheric shade temperature until 5 p.m. on the day of sampling and then at a constant temperature of 65°F. ± 2°F. until 9.30 a.m. the next day. The test with the methylene blue solution is carried out for 30 minutes at between 37-38°C. and must be commenced between 9.30 and 10.0 a.m. on the day after the sample was taken.

If the atmospheric shade temperature at any time exceeds 70°F. the test shall not be applied. This is a more realistic summer shade temperature than that prescribed in earlier regulations when 65°F. was the maximum limit for the storage temperature (pasteurised milk only). It was, in fact, found that the majority of samples passed the test even when the maximum shade temperature exceeded 65°F. but, because of the limit imposed, the tests had to be declared void.

The relationship between the clot-on-boiling and the methylene blue tests as applied to tuberculin tested milk was as follows. If the milk was in the hands of a producer or producer retailer the clot-on-boiling test applied, but if the milk had passed into the hands of a distributor the methylene blue test applied. If, therefore, a producer retailer sold part of the yield of his herd to a distributor the methylene blue test applied to the latter part while the clot-on-boiling test applied to the part he himself retailed. The clot-on-boiling test was probably a more precise test for keeping quality as it was strictly temperature compensated. The methylene blue test is only partially temperature compensated and it depends on the reducing power of certain types of bacteria in milk rather than being a test of actual keeping quality. The methylene blue test could, however, be the more stringent test in instances where certain pathogenic organisms which rapidly reduce methylene blue are present. As already indicated the clot-on-boiling test was replaced during the year 1964 by the methylene blue test.

The Phosphatase test for Pasteurised milk. This test indicates whether heat treatment has been adequate to destroy pathogenic organisms. The Aschaffenburg-Mullen phosphatase test is now used and it depends on the liberation by the enzyme phosphatase of p-Nitrophenol from the buffer-substrate solution. Phosphatase is always present in raw milk but it is almost entirely destroyed by the amount of heat treatment necessary for efficient pasteurisation. The test prescribed in earlier regulations was the Kay-Graham test which depends on the liberation of free phenol from the appropriate buffer substrate solution.

The present test has several advantages. Incubation at 37°C. is only necessary for two hours instead of 24 hours. The test can, therefore, often be completed on the day of sampling. There is far less likelihood of incorrect results being obtained due to contamination with phenol or the presence of phenol-producing organisms in the milk, as p-Nitrophenol is not in common use in a laboratory and is not produced by bacteria. It is only necessary, therefore, to carry out a blank and test the colour of the buffer substrate solution for absence of free p-Nitrophenol, whereas previously it was also necessary to carry out a control test on each milk to check the absence of free phenol and phenol-producing organisms.

The test is satisfied by milk which gives a colour reading after incubation for two hours corresponding to the liberation of not more than 10 ug of p-Nitrophenol per ml. of milk. As a general guide to samples that fail the test it may be said that samples which show more than 10 and up to 18 ug are slightly under-pasteurised or contain a small quantity of raw milk (0·1-0·2 per cent.). Samples showing more than 18 and up to 42 ug are under pasteurised or contain a small quantity of raw milk (up to 0·5 per cent). Samples showing more than 42 ug are grossly under-pasteurised or contain an appreciable quantity of raw milk. Raw milk would give a colour equivalent to several thousand micrograms of p-Nitrophenol which would not be directly matchable.

The Turbidity test for Sterilised Milk. This test indicates whether sterilisation has been efficient and it is identical with that prescribed in earlier regulations. It depends on the fact that heating to not less than 212°F. for a period sufficient for effective sterilisation will also completely denature all the soluble protein of the milk. Samples which show the presence of soluble protein after submission to the test are insufficiently heated or contain raw milk.

The conditions for the heat treatment of milk prescribed in the Regulations are as follows :—Pasteurised milk must have been treated by one or other of the following processes :—

(*a*) Retained at a temperature of not less than 145°F. and not more than 150°F. for at least 30 minutes and be immediately cooled to a temperature of not more than 50°F. ; or (*b*) Retained at a temperature of not less than 161 °F. for at least 15 seconds and be immediately cooled to a temperature of not more than 50 °F. ; or

(*c*) Retained at such temperature for such period as may be specified by the licensing authority with the approval of the Minister.

Sterilised milk must have been filtered or clarified, homogenised and thereafter heated to and maintained at such a temperature, not less than 212 °F., for such a period as to ensure that it will comply with the turbidity test prescribed.

With regard to the taking of samples the Regulations state that these may be taken at any time when the milk is in the possession of the licensed producer, pasteuriser, steriliser or dealer. Unopened bottles shall be delivered intact as samples to the testing laboratory but where the milk is in containers exceeding one quart in capacity samples shall consist of not less than two fluid ounces of the milk and shall be taken, using aseptic precautions, from well below the surface of the milk and transferred to a sterile stoppered bottle. Instructions are given in the regulations with regard to the marking of samples and all samples shall be placed, immediately after taking, in an insulated container which shall not be artificially cooled and they shall be transported to the testing laboratory with the least possible delay. Samples must arrive at the laboratory on the day they were taken, otherwise they must be discarded.

The Milk (Special Designations) (Specified Areas) Orders

The sequence of events since the year 1943, which has resulted in the making of a number of Milk (Special Designations) (Specified Areas) Orders, thereby prohibiting the sale for human consumption of raw undesignated milk in the areas specified, was given in some detail in this report for the year 1958. It is perhaps sufficient to say here that Section 37 of the Food and Drugs Act, 1955, makes it compulsory to use special designations in areas which have been made specified areas by orders made under Section 41 of the Act. The special designations which may, at the time of writing, be used in a specified area are " Pasteurised," " Sterilised " and " Untreated."

The first Milk (Special Designations) (Specified Areas) Order which affected parts of the area of the County Food and Drugs Authority came into operation on the 1st November, 1952. Nine other Orders, similarly affecting parts of the County, have come into operation since. By the 10th April, 1961, all the 93 (91 from 1st April, 1964) County districts in the County Food and Drugs Area had become specified areas. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 37 of the Food and Drugs Act, 1955, it follows from the above that a substantial number of samples of special designation milks are now being taken by County Sampling Officers for submission to the County Laboratory for examination by the statutory Phosphatase, Half-hour Methylene Blue or Turbidity tests.

During the year 1,102 samples of heat treated milk were submitted for examination by the Phosphatase test, the Half-hour Methylene Blue test or by the Turbidity Test. The samples were marked either Pasteurised, Tuberculin Tested (Pasteurised) or Sterilised and tables 25, 26 and 27 give particulars of the results obtained. Of these, as will be seen from the table, three samples failed the Phosphatase test, but none of these were taken at pasteurising plants. Six samples of heat treated milk failed to pass the Half-hour Methylene Blue test but again none of these were taken at pasteurising plants. In addition, fourteen samples of tuberculin tested milk were submitted for examination by the Half-hour Methylene Blue test and all of these were found to be satisfactory.

Three samples, not shown in the following tables, were submitted by Autonomous Food and Drugs Authorities. Of these, two samples from one authority, were found on examination to consist entirely of raw or Untreated milk. Legal proceedings were successfully instituted in respect of one of these two samples, which had been sold as Tuberculin Tested Milk (Pasteurised), and resulted in a fine of £20. As regards the other sample, the vendor was cautioned. The third sample, submitted as Tuberculin Tested Milk by another Autonomous Food and Drugs Authority, was found to be satisfactory.

Table 25

Phosphatase Tests, 1964

Type of Milk	Number Submitted	Number unsatisfactory			
		Group 2	Group 3	Group 4	Total
Pasteurised	308	1	0	1	2
T.T. (Pasteurised) ...	533	0	0	1	1
Untreated	0	0	0	0	0
Totals	841	1	0	2	3

Table 26

Half-hour Methylene Blue Tests, 1964

Type of Milk	Number submitted	Number unsatisfactory
Pasteurised	307	1
T.T. (Pasteurised) ...	537	5
Tuberculin Tested ...	14	0
Totals	858	6

Table 27

Turbidity Tests, 1964

Type of Milk	Number submitted	Number unsatisfactory
Sterilised	257	0

PART III.—THE FERTILISERS AND FEEDING STUFFS ACT, 1926

The Fertilisers and Feeding Stuffs Act, 1926, came into force on 1st July, 1928. It is intended to safeguard the purchasers of substances used for the fertilisation of the soil and for the feeding of cattle and poultry.

The general purpose of the Act, like that of the Act of 1906, which it repealed, is to provide civil remedies for the misdescription of, and to prevent fraud in, fertilisers and feeding stuffs. Its scope is defined by Regulations made by the Minister of Agriculture, Fisheries and Food.

In addition, Regulations were made by the Minister of Health during the years 1953, 1954 and 1958 (in exercise of powers first conferred by Section 2 of the Therapeutic Substances (Prevention of Misuse) Act, 1953, now replaced by Section 9 of the Therapeutic Substances Act, 1956), which permit the use of certain antibiotics, *viz.*, penicillin, aureomycin, streptomycin and oxytetracycline in pig foods and poultry foods and for horticultural purposes. These Regulations prescribe conditions with regard to labelling and also specify in regard to pig and poultry foods maximum limits for the amounts of the prescribed antibiotics which may be present.

It has already been mentioned that the scope of the Fertilisers and Feeding Stuffs Act is defined by Regulations. The Regulations at present in force are the Fertilisers and Feeding Stuffs Regulations, 1960. These were made following a general review by the Standing Advisory Committee of the previous regulations, including the previously prescribed methods of analysis. An amendment was made to the Regulations during the year 1962 in that the Fertilisers and Feeding Stuffs (Amendment) Regulations, 1962, now permit the third part of a sample taken by an official sampler or inspector under the Act to be sent to the appropriate person specified in the Regulations by the recorded delivery service as an alternative to registered post.

During the year under review, *i.e.*, in January, 1964, a further amendment was made and this, The Fertilisers and Feeding Stuffs (Amendment) Regulations, 1964, came into operation on the 1st March, 1964. The effect of these amending regulations is to bring nitrogenous gas liquor, ammoniacal gas liquor and gas liquor within the scope of the Fertilisers and Feeding Stuffs Act and to prescribe a method of analysis and limits of variation. The new regulations also amend the definition and limits of variation for bone meal, and alter the limit for free acid in sulphate of ammonia below which it is not required that the percentage of free acid shall be declared. The definitions of dried grass and other dried green crops have been amended and the references to potassium salts in the First and Fourth Schedules to the principal regulations have also been amended. The method for the preparation of a sample in the solid form for the determination of sugar has been revised. Finally, provision has now been made for the marking and sampling of liquid fertilisers in bulk containers or tankers.

In a Review of the Persistent Organochloride Pesticides published in February, 1964, by the Advisory Committee on Poisonous Substances Used in Agriculture and Food Storage, it was recommended that the use of aldrin and dieldrin in fertiliser mixtures should cease as soon as this could be arranged. These two pesticides are related as aldrin is converted into dieldrin in the animal body and in the soil. Dieldrin is persistent in soils for a number of years and the annual application of aldrin or dieldrin with fertilisers to soils is quite unnecessary for pesticidal purposes and could lead to undesirable accumulations in soils. Following this recommendation The Fertilisers (United Kingdom) Scheme, 1964, made on the 25th June, 1964, under the Agriculture (Fertilisers) Act, 1952, stipulates that fertilisers to which aldrin or dieldrin has been added before purchase will not be eligible for government subsidy.

Fifty-One samples have been examined for the County during the year under review. Of these, 27 were fertilisers and 24 consisted of feeding stuffs. The fertilisers comprised 25 formal samples and two informal samples. All the feeding stuffs samples were formal.

In addition, 34 samples (8 formal and 26 informal) were examined for Autonomous Authorities. Of these, 17 samples (one formal and 16 informal) were fertilisers and 17 (seven formal and ten informal) consisted of feeding stuffs.

Of the 27 samples of fertilisers examined for the County 14 were found upon analysis to be correct within the limits of variation permitted by Regulations made under the Act, and ten showed minor deviations outside the permitted limits of variation. Brief accounts of the three remaining samples are given below.

Samples Nos. 26/12/A and 27/12/A, both Compound Fertilisers, taken by an Official Sampler at a farm and supplied by the same seller, accorded with the definition of compound fertilisers or mixed fertilisers contained in the second column of the Fourth Schedule to the Fertilisers and Feeding Stuffs Act, 1926. They should each therefore have been accompanied by a declaration of the amounts, if any, of Nitrogen, Phosphoric Acid Soluble in Water, Phosphoric Acid Insoluble in Water and Potash instead of the declarations " 20-10-10 " and " 10-10-18 " respectively with which the bags were marked. It transpired that the retailer relied upon certain markings on the containers, such as those given, as being the percentages of nitrogen, phosphoric acid and potash. He was informed that this was not considered to be a sufficient or adequate compliance with the Act. On reference back to the manufacturer and original packer, it was ascertained that these markings were only to be considered as identification marks which had to be read in conjunction with the appropriate entries in the register of analyses that was maintained. The manufacturer supplied the necessary particulars to the retailer by a statutory statement on the reverse of the invoice. The omission was that of the retailer who gave an assurance that statements would be given in future. The manufacturer also agreed to print a full statement of analysis on each container of the article in conformity to the Act and Regulations. Sample No. 28/10/A, also a Compound Fertiliser, had a deficiency in the amount of soluble phosphoric acid found (0·5 per cent. outside the limits of variation). This might have been to the prejudice of the purchaser but its cause could have been partially due to reversion to insoluble phosphoric acid, this latter figure being higher than that declared. The sample was in the form of both course and fine powder and this could also have been responsible for some difference due to possible partial separation of constituents during mixing, storage, etc. The manufacturer gave an assurance to look into the method of mixing and also the system of sampling for analyses made by his own chemist.

Of the 24 samples of feeding stuffs examined for the County, 18 were found to be correct within the permitted limits of variation and four showed only minor deviations outside the permitted limits. The remaining two samples are described briefly below.

Sample No. 42/7/A, Barley Meal, had been taken from sacks which did not bear a mark. This article is included in the First Schedule to the Fertilisers and Feeding Stuffs Act, 1926, and should, therefore, have been marked in accordance with the requirements of Section 4 and the First Schedule to the Act. Sample No. 29/12/A, Growers Meal, was, in my opinion, a compound meal as defined in Part II of the Fourth Schedule of the Act and the difference in protein found (12·9 per cent. as against the guaranteed figure of 16·0 per cent.) was to the prejudice of the purchaser. In this instance, because of their previous good record, the manufacturers were cautioned.

The analytical results of all the County Samples examined during the year together with the guaranteed figures contained in the Statutory Statements, are given in the following two tables.

Table 28

Fertilisers

Sample Number District and Description	Formal or Informal	Per cent. Nitrogen		PER CENT. PHOSPHORIC ACID (P_2O_5)								Per cent. Potash K_2O		Other Figs. per cent.
				Total		Soluble		Insoluble		Soluble in Citric Acid				
		G	F	G	F	G	F	G	F	G	F	G	F	
25/12/A Warrington Nitra Shell	F	23·0	23·0											A
21/10/A Seaforth "—" D.12 Manure	F	6·12	6·25		6·20	3·25	2·35	2·92	3·85			12·50	11·3	
22/10/A Seaforth "—" D Manure	F	8·00	8·7		3·5	2·10	1·6	1·96	1·9			4·15	4·2	
41/11/A Widnes "—" 49 Granular Fertiliser	F	14·0	13·9		6·15	5·5	5·75	0·5	0·4			20·0	21·0	
42/11/A Widnes "—" 47 Granular Fertiliser	F		0·1		14·05	13·0	12·75	1·0	1·3			28·0	28·3	

Table 28—continued

Sample Number District and Description	Formal or Informal	Per cent. Nitrogen		PER CENT. PHOSPHORIC ACID (P_2O_5)								Per cent. Potash K_2O		Other Figs. per cent.
				Total		Soluble		Insoluble		Soluble in Citric Acid				
		G	F	G	F	G	F	G	F	G	F	G	F	
26/12/A Warrington "—" No. 200 Fertiliser	F		18·5		9·25		8·9		0·35				10·0	B
49/9/A Manchester Bone Meal	F	4·0	3·7	20·0	22·9									
50/9/A Manchester Meat and Bone Meal	F	9·25	9·35	3·35	3·3									
27/12/A Warrington "—" No. 100 Fertiliser	F		9·4		9·4		8·7		0·7				17·8	C
6/2/A Lonsdale Nitro-Chalk	F	21·0	21·2											D
7/2/A Lonsdale "—" Growmore	F	7·5	7·3		10·9	7·4	6·9	2·9	4·0			7·5	6·8	
25/10/A Seaforth "—" D6 Manure	F	6·12	6·6		5·3	3·25	2·3	2·91	3·0			6·3	7·0	
26/10/A Seaforth "—" D10 Fertiliser	F	5·0	4·75		4·55	2·55	1·7	2·49	2·85			10·6	11·6	
48/4/A Lower Blackburn Hoof and Horn Meal	F	14·0	14·1											
49/4/A Lower Blackburn Bone Meal	F	3·7	4·55	20·6	23·3									
43/11/A Widnes "—" Granular Fertiliser	F	10·0	10·3		15·2	13·8	14·1	1·2	1·1			10·0	10·7	
44/11/A Widnes "—" Granular Fertiliser	F	16·0	15·6		10·25	8·5	9·55	0·5	0·7			9·0	9·7	
1/9/A Manchester Dried Blood	F	12·7	13·2											
2/9/A Manchester Meat and Bone Meal	F	9·25	9·55	3·35	3·45									
6/2/B Lonsdale "—" Plant Builder	I	23·2	23·2		16·3	15·4	16·3					15·4	16·2	
7/2/B Lonsdale "—" Lawn Tonic	I	40·0	38·5		10·3	10·0	10·3						0·03	

Table 28—continued

Sample Number District and Description	Formal or Informal	Per cent. Nitrogen		PER CENT. PHOSPHORIC ACID (P_2O_5)								Per cent. Potash K_2O		Other Figs. per cent.
				Total		Soluble		Insoluble		Soluble in Citric Acid				
		G	F	G	F	G	F	G	F	G	F	G	F	
27/10/A Seaforth “—” D10 Manure	F	5·0	4·6		5·35	3·0	2·7	2·0	2·65			10·5	10·1	
28/10/A Seaforth “—” D16 Manure	F	8·0	8·7		7·3	5·0	4·0	3·0	3·3			12·5	11·6	
45/11/A Widnes “—” Granular Fertiliser	F	6·0	6·4		15·2	13·8	13·8	1·2	1·4			15·0	14·7	
46/11/A Widnes “—” Granular Fertiliser	F	10·0	9·6		14·4	13·8	13·5	1·2	0·9			10·0	10·1	
3/9/A Manchester Pure Raw Bone Meal	F	3·7	4·2	20·5	22·9									
4/9/A Manchester Pure Dried Blood	F	12·7	14·2											

G — Guaranteed

F — Found

A — Guaranteed Carbonate of Lime 31·0%, Found Carbonate of Lime 31·9%.

B — Guaranteed Particulars stated in the form “ Analysis 20—10—10.”

C — Guaranteed particulars stated in the form “ Analysis 10—10—18.”

D — Guaranteed neutralising value 16·0% (CaO), found Neutralising value 19·9% (CaO).

Table 29

Feeding Stuffs

Sample Number District and Description	Formal or In-formal	Per cent. Oil		Per cent. Protein		Per cent. Fibre		Other Figures per cent.
		G	F	G	F	G	F	
39/3/A Kirkham Chick Growing Meal ...	F	4·5	3·0	16·8	17·0	8·9	3·9	
40/3/A Kirkham Sow and Weaner Meal	F	5·0	3·3	16·25	17·85	8·0	4·4	
41/7/A Bury Coarse Dairy Meal ...	F	4·0	4·0	18·0	16·5	7·5	7·4	
42/7/A Bury Barley Meal	F		1·65		9·1		4·7	A
23/10/A Seaforth Battery/Deep Litter Meal	F	3·0	3·0	16·5	15·9	4·0	4·1	
24/10/A Seaforth Hybrid Layers Meal ...	F	3·5	2·8	17·0	17·85	3·5	2·5	
1 Leyland "—" Battery Mash, V.A.	F	3·0	3·1	17·5	16·0	5·5	4·6	
2 Leyland "—" Growers Mash, V.A.	F	3·0	3·0	16·5	16·0	5·5	4·9	
28/12/A Warrington Battery Mash	F	2·5	2·4	17·0	16·3	6·0	4·9	
29/12/A Warrington Growers Meal ...	F	3·0	3·0	16·0	12·9	6·0	5·5	
34/5/A Higher Blackburn No. 2 Pig Meal	F	3·0	2·3	15·0	14·8	4·75	5·3	
35/5/A Higher Blackburn Layers Mash	F	3·0	2·7	16·25	15·7	5·0	5·85	
8/2/A Lonsdale Winter Layers... ...	F	3·5	4·2	16·5	15·9	7·0	4·2	
9/2/A Lonsdale Pig Rearing Meal ...	F	3·5	3·6	15·0	15·4	7·0	4·4	
41/3/A Kirkham Sow/Weaner Meal ...	F	2·5	2·6	15·0	15·7	5·0	3·7	
42/3/A Kirkham Battery and Intensive Layers Meal	F	3·0	2·9	15·5	15·8	5·0	3·3	

Table 29—*continued*

Sample Number District and Description	Formal or In-formal	Per cent. Oil		Per cent. Protein		Per cent. Fibre		Other Figures per cent.
		G	F	G	F	G	F	
3/6/A Leyland "—" Growers Mash ...	F	3·5	3·3	16·5	17·5	6·0	4·0	
4/6/A Leyland "—" Breeding Sow Meal	F	3·0	3·0	16·0	15·3	5·0	4·1	
1/4/A Lower Blackburn Extra Battery Mash	F	3·0	2·5	17·6	16·1	5·0	5·4	
2/4/A Lower Blackburn Layers Mash	F	2·75	2·5	17·0	15·3	6·5	5·7	
43/3/A Kirkham Pig Breeders Meal ...	F	2·5	2·5	15·5	15·5	6·0	4·2	
44/3/A Kirkham Pure White Fishmeal...	F	4·0	4·6	66·0	64·6			B
10/2/A Lonsdale Sow and Weaner Meal	F	3·5	3·9	16·0	14·3	6·0	4·9	
11/2/A Lonsdale Intensive Layers Meal	F	3·5	3·9	18·0	16·2	6·0	5·7	

G — Guaranteed

F — Found

A — Found, Sand and other Silicious matter 0·6% and Ash 2·4%.

B — Guaranteed Phosphoric Acid 8·0% and Salt 2·0%, Found Phosphoric Acid 8·4% and Salt 1·45%.

PART IV.—WATERS, EFFLUENTS, ETC.

Potable Waters

Of the 145 water samples examined in 1964 under the general heading of Potable Waters, fifty-two samples were of raw waters destined to be used for public supplies and two were examined in connection with the investigation of new sources of supply. These, with seventy other samples, seventeen of which were taken at dairies, were analysed to assess their suitability for drinking or domestic use. Fifteen samples were examined primarily for lead and fluoride content following the issue of the Ministry of Health Circular 1/64, five were examined for metals and pH. only, and in one case, only the deposit in the water was investigated. Table 30 classifies the results obtained on the 124 waters examined for possible pollution according to the source and organic purity.

Table 30

WATERS 1964

Source	Fit	Doubtful	Unfit	Total
Deep Well	13	2	0	15
Shallow Well	5	0	2	7
Springs	2	0	0	2
Upland Surface	29	8	0	37
Upland Surface mixed with other waters ...	16	5	0	21
Rivers	31	4	0	35
Miscellaneous	5	2	0	7
Total ...	101	21	2	124

Forty-eight of the samples in the above table were from Public Supplies (8 deep well, 24 upland surface, 7 upland surface mixed with spring or other water, and 9 river). Ten of these contained traces of nitrites and one other of them contained a relatively large amount of free ammonia. In one case of nitrites being present, the water concerned had been in a hot water supply for a period of approximately four days and the nitrites were almost certainly due to reduction of nitrates by the metal pipework. Special consideration of the bacteriological findings was recommended in all the other instances however, although chemical treatment of the water was probably the cause of two of the occurrences and of the high ammonia found. Subsequent storage of water in metal equipment after delivery by the respective water undertakings probably gave rise to the nitrites present in four of the samples and may have been responsible for that in a fifth. In the last two instances the occurrences were associated with deposits found in the water. One of these deposits consisted of alumino-ferric derived from chemical treatment of the water. The last case was turbid water containing algae, but was derived from a source known to have been treated chemically.

Nine of the dairy water samples, used for general dairy purposes, were taken from supplies other than public supplies. Three were taken from a water lodge, four were mixed upland surface and spring waters, and two were re-circulated waters passing through sterilising and pasteurising plant. One of the recirculated waters contained a faint trace of nitrites, probably derived from nitrates in the water reduced by the metal of the plant, but all the others were reported suitable for their intended purpose. Heavy chlorination had been administered to six of the above-mentioned dairy waters from private sources, but none was likely to lead to taint in milk.

The highest amount of free chlorine found in water taken from a consumer's tap was 0·56 part per million, and this was discernible by smell. Apart from this one case, the highest figure recorded for free chlorine in 1964 was in water prior to distribution and was 0·32 part per million. One hundred and twenty-two samples were tested for free chlorine and it was found in forty-one of them. The mean content of chlorine found in tap waters which contained it was 0·06 part per million, and at pump houses or other points of distribution the mean chlorine content was 0·18 part per million.

Sixteen samples were submitted because of complaints made by members of the public, and ten more were concerned with special investigations mainly into questions of the corrosive nature of the water supplies. The complaints concerned one case of illness, two where taste was involved, two were of turbitity and two arose from solid material being present in the tap water. One sample was taken where a growth had appeared in a cistern, one involved the corrosion of an aluminium kettle and another the blackening of aluminium ware. One complaint concerned water which turned blue in contact with soap, one was from a river source and was said to be " frothy," and finally two samples were examined in connection with an allegation that the supply was variable and this affected the cleaning power of detergents. The special investigations included examination of water from a new well ; a series of samples taken, as a direct result of the " blue water " complaint, from other points on the same private supply and which were found to contain lead ; a series of samples from a private supply initially contaminated with lead from a very long lead supply pipe which finally was made satisfactory by replacing this pipe with Alkathene, and three investigations into the possible corrosive nature of waters which were subsequently shown not to be corrosive.

Eighteen of the 145 waters were submitted by the County Medical Officer of Health, 40 by the Lune Valley Water Board, 19 by the Lakes and Lune Water Board, 11 by the Makerfield Water Board, and the others by the following Local Authorities :—County Borough of Southport, 4 ; Boroughs of Chorley, 6 ; Darwen, 7 ; Haslingden, 2 ; Leigh, 1 ; Morecambe, 1 ; Urban Districts of Adlington, 2 ; Ashton-in-Makerfield, 1 ; Blackrod, 1 ; Fulwood, 1 ; Kirkby, 1 ; Leyland, 1 ; Longridge, 2 ; Newton-le-Willows, 1 ; Orrell, 1 ; Ramsbottom, 2 ;

Standish-with-Langtree, 2 ; Thornton Cleveleys, 2; Tottington, 4 ; Urmston, 1 ; Walton-le-Dale, 2 ; Rural Districts of Chorley, 3 ; Garstang, 2 ; North Lonsdale, 3 ; Preston, 1 ; and Whiston, 3.

TOXIC METALS IN WATER

One hundred and forty four samples of potable water were tested for the presence of lead in 1964, a hundred and thirty-eight were tested for copper and zinc, and a hundred and thirty-eight for iron.

The lead results are summarised in table 31.

Table 31

Lead parts per million	None detected	Less than 0·1	0·1 to 0·3	0·31 to 1·0	More than 1
Number of samples ...	128	5	4	4	3

The highest lead content found was 2·5 parts per million in water drawn first thing in the morning from the hot water system in a house using a private supply of corrosive water which had initially been sampled because the water turned blue when soap was used with it. The cold supply was free from lead but both the hot and cold water contained copper. These findings led to another house on the same supply being investigated, where 1·0 part per million of lead was found in the cold water supply. Some months later a storage tank fed by the same supply yielded 1·8 parts per million of lead in its water, but the lead content in the water from the house previously showing 1·0 part per million had then been reduced to 0·2 part per million. Attention was drawn to the international recommended limit of 0·1 part per million for lead in drinking water, and the need to run all standing water to waste was stressed. A figure of 1·6 parts per million of lead was obtained on water from a seldom used tap fed by pipework which ran close to central heating pipes. Water had not been drawn from this tap for at least four days prior to sampling. Another private supply had been sampled in 1961 and in 1962, the second sample having shown twice as much lead as the first. In 1964 it was again sampled and was found to contain 0·95 part per million of lead. Even after prolonged flushing a second sample of this water was found to contain 0·4 part per million of lead and the reason proved to be that it was conveyed through a 190 yards length of lead supply pipe. The owner was persuaded to replace this pipe with one made from Alkathene and a subsequent sample showed the supply to be free from lead. Amounts of lead ranging from 0·03 part per million up to the recommended limit of 0·1 part per million were found in five of the samples which had been submitted in connection with the Ministry of Health circular ; levels of 0·04 part per million, 0·22 part per million and 0·3 part per million were found in samples submitted for public health purposes from private supplies conveyed through lead pipes, and 0·36 part per million was found in the first draw water of a new installation which utilised a private spring yielding acid water.

Forty-four samples contained copper. The international standard for copper in drinking water is 1·0 part per million, but in thirty-five of the occurrences the copper content of the waters did not exceed one-tenth of this amount. The only sample in which the recommended limit was exceeded was the complaint sample already mentioned as the sample from a hot water supply which contained most lead. The water from the house concerned contained 6·4 parts per million of copper in the hot supply and 0·7 part per million in the cold supply. The only other case in which the recommended limit for copper was approached, was again a water taken from a hot water supply. The copper content of a water taken in connection with a complaint about the corrosion of aluminium kettles was only 0·03 part per million. It was subsequently found, however, that the house holder was in the habit of filling the kettle from the hot water tap of his new bungalow which had been fitted with a copper hot water system.

The usually accepted maximum limit for zinc in drinking water is five parts per million. The same high copper content sample which would not wash white contained two parts per million of zinc, but the highest quantity found in any of the other fourteen waters in which it was detected was 0·7 part per million.

Iron appears to be present, either associated with peat acids or dissolved in traces from the metal of installations, in almost all the potable waters of this district. Only four samples, three sampled prior to distribution, were found to be free from detectable amounts of iron in 1964. In twenty cases the amounts present were in excess of the 0·3 part per million usually regarded as the level above which turbidity or staining may occur. Seven of these, however, were untreated waters, seven were from private lodges or springs or were required for special purposes, one was a new well and one was the water which had been idle in pipes warmed by a hot water system. The results are summarised in table 32.

Table 32

Iron parts per million	None detected	Less than 0·1	0·1 to 0·3	0·31 to 1	1·1 to 5	More than 10
Number of samples	4	48	66	13	6	1

Two of the other waters containing iron in excess of 0·3 part per million were piped public supply upland surface waters in which the whole of the iron seemed to be soluble. The very high iron content indicated in the table was in a deep well water piped to a rather remote household, and almost the whole of the thirty-seven parts per million of iron present was in insoluble form. Flushing of the main was advised in this case. The last case of high iron content occurred in water from a public supply which was then stored in a cistern in which a growth of iron bacteria had established itself. Cleaning and hypochlorite treatment was suggested. Only in five instances were the samples affected by iron brought to the laboratory as the result of complaints.

Manganese was present in all but one of the twelve waters tested for its presence. In two cases only, both deep well raw waters, were the amounts found greater than the accepted limit of 0·1 part per million. The manganese contents of these two waters were 0·26 and 0·27 part per million respectively.

The optimum and recommended amount of fluorine in waters fluoridated as a prophylactic measure against dental caries is one part per million. None of the fifteen waters tested for fluorine had been fluoridated, and the natural amounts found ranged from 0·02 part per million to 0·11 part per million.

OTHER WATERS, EFFLUENTS, ETC.

Forty-eight samples were submitted under this heading.

Six were sewage effluents examined partly to ascertain whether they complied with the standards of purity recommended by the Royal Commision on Sewage Disposal and partly to check the effect of a new treatment. Two complied. One complied with the recommendation that suspended solids be less than 30 parts per million, and the remaining three did not comply with this or with the recommendation that the biochemical oxygen demand be less than 20 parts per million of dissolved oxygen absorbed from solution in five days. There were two sewages from the dry weather flow sump associated with this investigation and both were " weak sewage."

One trade effluent was analysed for metals, in connection with the proposed establishment of a new factory.

Two samples of sewage containing trade effluent were analysed to help with a problem arising from the encrustation of pumps. The deposit consisted of calcium carbonate and the sewages, which were very alkaline, were found to be supersaturated with calcium carbonate.

Water seeping into the basement of a chapel was found to show little evidence of sewage contamination. A sample taken from a field drain which had started to discharge a considerable amount of water on to a roadway proved to contain enough sewage to suggest that the flow originated from a broken domestic drain.

Unauthorised tipping led to a complaint that spring water used for the watering of livestock was being contaminated. The water absorbed 13·5 parts per million of oxyegn from permanganate solution in three hours, which is three and a half parts more than is usually regarded as the limit for water which may be considered suitable for this purpose. In addition, the sample contained 37 parts per million of toluene. This is approximately one tenth of the quantity likely to produce narcotic symptoms, but its presence was considered undesirable in water likely to be used continually for ingestion by animals.

Two river waters were examined, both corresponding to the Royal Commission classification " bad or polluted stream." One of these was feed water for a canal about which complaints of odour and colour were made. The canal water contained hydrogen sulphide probably resulting from anaerobic conditions in the mud at the bottom of the canal. The river water feed brought iron into contact with the sulphide, and the result was a large scale version of the type of schoolboy experiment which gave chemistry the nickname " Stinks."

The remaining two waters in this section were waters from tanks in which tropical fish had died. No evidence of toxic material was found, although in one case the ammonia content of the water was at a level not considered very attractive for fish. Such fish are very susceptible to changes in their environment and the innocuity of the water merely eliminated one of several possible causes of death.

Twenty-nine samples of swimming bath and sea bathing lake waters were examined for compliance with the Ministry of Health Recommendations (pH should exceed 7 but should not exceed 8 and free chlorine should not be less than 0·2 part per million or much greater than 0·5 part per million), twenty-six being from public baths. Eleven samples complied with the recommendations although in three of these cases ammonia in the water was building up to levels at which it was felt advisable to recommend that the plant be operated beyond bathing times. There were ten samples in which deficiencies of chlorine were reported, although in two instances other samples taken at the same time from different parts of the same pools are included above among samples which complied. Another bath from which two samples were taken at the same time complied with the recommendations at the outlet, but contained approximately three times the maximum chlorine recommended at the inlet. Since the condition of the water appeared very satisfactory, no change in operating conditions was thought necessary. One open air bath was found to be too alkaline and to contain a rather high chlorine residual, but as the ammonia in the water was forming chloramines with the bulk of the chlorine there was no recommendation made to have the chlorine dose reduced. One other public bath was found to be slightly too alkaline and to possess a high residual chlorine content, but as it had been newly filled and had had no contact with bathers, no special recommendation was thought to be necessary. Two samples taken on different days from another bath showed that the water had become quite acid, but after this had been pointed out the necessary adjustment was made.

The three samples other than from public swimming baths were from a school where trouble had been experienced with clogged filters. The water used was very hard and the first sample was found to contain precipitated calcium carbonate. This also proved to be the material which had clogged the filters. The swimming bath water was very alkaline. After a week of running without bathers it was found that the sodium content had increased owing to addition of sodium hypochlorite as recommended by the installers, and that the calcium content of the water had halved. It was arranged for the water to be neutralised with acid but sufficient solid calcium carbonate had remained in the filters to nullify this action, and a later sample was found still to be too alkaline. As one might expect, it contained increased calcium through solution by the acid of some of the solid calcium carbonate in the filter. Arrangements were made for the whole system to be cleaned and refilled and a recommendation was made that a system of scientific control or inspection be instituted. The chlorine content of the bath was 3·1 parts per million which would normally be considered unnecessarily high. Recent bacteriological experiments, however, by another authority indicate that in shallow learner baths of relatively small water capacity such levels of chlorine are advantageous in order to cope with the higher concentration of pollution which may arise.

PART V.—RADIOACTIVITY

Radioactivity measurements, which were first started in September, 1958, have continued to be carried out each month of the year under review on samples of air, rainwater, tapwater and milk. Samples of school dinners and several other foods have also been tested for strontium 90. Altogether 94 samples were examined in the year 1964, these were made up as follows :—Rainwater and deposits 13, air samples 41, cabbage 1, baby food 2 and composite samples of milk 13, tapwater 16, flour 1, oatmeal 1 and school dinners 6.

1964 was again a year with a relatively high rate of radioactive fallout, practically all of which was derived from the intensive Russian and American tests in the years 1961 and 1962. Large nuclear explosions in the megaton range send most of the resulting fission products high into the stratosphere and, for tests near the Arctic Circle it is thought that approximately half is deposited back on the ground as fallout within 12 months and a further quarter during the next 12 month period and so on. For similar explosions near the equator the half-life period is two or three times longer. The average activities of Strontium 90 in air and rainwater samples in 1964 were both approximately two-thirds of the record high level recorded for the previous year.

The first Chinese nuclear test reported to be in the kiloton range, occurred on the 16th October, 1964. Fall out from this was detectable in air and rainwater samples during the last week of October and air activity reached a peak in the first week in November. Most of this activity was due to short-lived isotopes and its contribution to the measured strontium 90 for the fourth quarter of the year was negligible.

Radioactivity of Air Samples

Artificial radioactivity in the air was determined throughout the year by passing measured volumes through paper thimbles and determining the beta activity of the collected material after allowing sufficient time for the natural activity to decay. Strontium 90 was later determined on the combined deposits collected over each three month period. The results are recorded in table 33. It will be seen that, as usual, the radioactivity of the air samples reached its highest value during the second quarter of the year, due to the greater rate of interchange of material between the stratosphere and the lower atmosphere which occurs during this period. The deposition of fallout material from the 1961 and 1962 tests decreased substantially in the latter part of the year. Fallout from the Chinese nuclear test on October 16th caused a noticeable increase in air activity in the last week in October and during November.

This was mainly due to the short-lived isotopes which occur in fresh fission products and was proved to be so by the shorter half-life of the deposit on filters at this time. Strontium 89, an isotope with a half-life of 51 days, was determined and its activity is shown in table 33. From the known ratio of Strontium isotopes in fresh fission products it can be calculated that the Chinese bomb was the cause of only one per cent. of the more dangerous Strontium 90 activity found for air samples taken over the last quarter of 1964.

The average total beta activity for the air samples in 1964 was 0·31 picocuries per cubic metre and the average Strontium 90 activity was 0·022 picocuries per cubic metre compared with the limits recommended for large populations of 33 and 3·0 units respectively.

Rainwater

An 18 inch square raingauge on the roof of the County Laboratory was used to collect samples of rainwater and associated deposits. These were examined each month for total beta activity and for Strontium isotopes. The results are shown in table 34. It will be seen that fallout activity was still at a relatively high level throughout the year under review. The amount of Strontium 90 collected was equivalent to 9,910 picocuries per square yard. This is approximately two-thirds of the amount collected in 1963 and a similar ratio was found for the air samples examined during these two years.

Drinking Water

Mains tapwater from an upland surface gathering ground was also examined each month for total beta activity and the combined samples were examined each quarter for Strontium 90. The results are recorded in table 35. The average beta activity for the year under review was 21·7 picocuries per litre of which 1·39 picocuries per litre was due to Strontium 90. The international Commission's recommended maximum permissible concentration for Strontium 90 in drinking water for large populations is 33 picocuries per litre. In 1963 there was an average of 1·50 picocuries of Strontium 90 per litre in samples from this supply.

Milk

Samples were examined regularly throughout the year because milk is known to be the principal food from which Strontium 90 at present enters the diet of people in the United Kingdom and because it may form the sole diet of infants. The composite samples examined were obtained by taking an aliquot portion from each sample of heat-treated milk received in the laboratory for the regular bi-monthly testing of processing plants in the County area. The monthly turnover of these plants is approximately two million gallons and the composite sample obtained should be reasonably representative of the milk consumed in Lancashire.

The results obtained for Strontium 90 in the above mentioned samples are shown in table 36. It will be seen that the concentration of this isotope was close to 26 picocuries per gramme of calcium for the first 9 months of 1964 with only a slight seasonal peak of 29·8 units in July. There was a decrease to around 20 units in the last three months of the year. This is in contrast to 1963 when the milk produced during the first third of the year from stored food hardly affected by the 1961 and 1962 tests had only 11 units of Strontium 90 ; while the summer milk, affected by fallout from both tests series contained approximately 37 units. The average for Strontium 90 in Milk in 1964, i.e. 24·8 picocuries per gramme of calcium, was slightly higher than the average of 24·0 Strontium units found in the previous year.

School Meals

The results shown in table 37 are for composite samples from different Schools each composed of dinners taken over five consecutive days. The average weight of a meal varied greatly and depended on the age of the children and the type of meal but, as in previous years, the calcium was close to 0·08 per cent. in all samples. Approximately two-thirds of the calcium in these dinners was probably due to the policy of using three-quarters of an ounce of separated milk powder per meal. The level of activity of Strontium 90 in these meals is greatly influenced by its level of activity in milk at the time and place at which the milk powder was manufactured. Thus the unexpected lower results for the samples in January and April was probably due to a change over to New Zealand milk powder owing to a shortage of the English product at this time.

The average Strontium 90 in the 30 dinners was 26·9 picocuries per gramme of calcium compared with averages of 29·9 and 13·3 units found for similar samples in the years 1963 and 1962 respectively.

Other Foodstuffs

The results obtained for Strontium 90 are listed in table 38. The two cereal based baby foods gave results of 14·3 and 21·5 Strontium Units and were very similar to the results of 15·9 and 22·1 Strontium Units respectively found for the same foods bought in the same month during the previous year. Both results compare favourably with the average value for fresh milk for the year which was 24·8 Strontium Units.

The summer cabbage had an activity of 45·5 Strontium Units compared with activities of 32·1 and 50·4 Strontium Units found for cabbages bought in June and November 1963 respectively.

The level of Strontium 90 in cereals continued its upward trend. The level found in the composite sample of oatmeal for 1964 was 155 Strontium Units compared with 67 Strontium Units in 1963 and 39 Strontium Units over the previous three years. The composite sample of white flour had 12·0 picocuries per gramme. of calcium compared with 5·6, 4·9, 3·0 and 2·5 Strontium Units in the previous four years. These results for flour would all have been approximately six to seven times higher if the samples had not also contained the compulsory addition of creta praeparata required by the Flour (Composition) Regulations, 1956. This added chalk has the effect of reducing the Strontium 90 to calcium ratio.

Interpretation of Results

The picocurie (the alternative name for micromicrocurie) is a measure of the activity of a radioactive isotope and is equivalent to that of one millionth of a millionth of a gramme of radium. In the case of Strontium 90, one picocurie means that, on average, 2·22 atoms are breaking down per minute to give, with its daughter product yttrium 90, 4·44 beta particles per minute. Calcium and Strontium are transferred from the diet to the bone in a relatively constant ratio, calcium, therefore, depresses the absorption of Strontium by the skeleton. The amount of Strontium deposited in the bone is determined by the ratio of Strontium to calcium in the total diet and not by its content of Strontium alone. In comparing diets or the effects of different foods, therefore, it is the Strontium 90 to calcium ratio which is of importance ; this ration is conventionally expressed in terms of Strontium Units (S.U's) where one Strontium Unit is equal to one picocurie of Strontium 90 per gramme of calcium.

Fallout material contains a large number of radioactive isotopes but only a few are absorbed from the diet and retained in the body. Of these isotopes Strontium 90 has been singled out for attention because of its long half-life of 28 years and because it is concentrated in the bone where it is retained with an effective half-life of 7½ years. Bone and bone marrow are also the body tissues which receive the highest total radiation dose from the various components of fallout and Strontium 90 is the main contributor to this dose.

From the results obtained in 1964 it can be estimated that the average adult diet over the year would have a Strontium 90 to calcium ratio of approximately 24 Strontium Units, the same level as that found for 1963. The body discriminates to some extent against Strontium so that this element is absorbed at only about one quarter of the rate for calcium. Thus a level of 24 Strontium Units in the diet will lead to 6 Strontium Units in growing bone and this would give rise to a dose rate to this tissue of 16 millirems per year. These figures should be compared with the limit of 67 Strontium Units recommended as the maximum permissible body burden for large populations by the International Commission for Radiological Protection and with the average dose rate from natural radiation to bone which has been estimated at about 130 millirems per year.

Table 33

Radioactivity of Air Samples

Sampling Period	Approximate Total Beta Activity	Strontium 90
1964	Picocuries per Cubic Metre	Picocuries per Cubic Metre
Jan.	0·35	0·022
Feb.	0·46	
March	0·32	
April	0·42	0·043
May	0·72	
June	0·49	
July	0·32	0·018
Aug.	0·16	
Sept.	0·11	
Oct.	0·11	0·005 (Sr 89 =0·008)
Nov.	0·24	
Dec.	0·05	
Average for year	0·31	0·022

Table 34

Radioactivity of Rainwater and Deposit

Activity deposited per square yard

Month	Rainfall	Volume of Rain	Beta Activity of Acid Soluble Matter	Strontium 89	Strontium 90
1964	Inches	Litres	Picocuries (1)	Picocuries	Picocuries
Jan.	1·94	41·2	36,600	—	560
Feb.	0·95	20·2	19,650	—	346
March	1·74	37·1	27,700	—	480
April	2·96	62·9	—	—	1,148
May	3·37	71·6	70,300	—	1,612
June	1·83	39·0	62,200	—	1,672
July	2·99	63·7	52,900	—	1,480
Aug.	4·19	89·0	54,600	—	1,204
Sept.	2·61	55·4	22,400	—	528
Oct.	3·23	68·8	12,600	152	296
Nov.	3·33	70·8	12,400	376	272
Dec.	5·36	114·1	12,600	92	312
Totals	34·50	733·8	—	—	9,910

(1) Activity as measured at the end of each month in a liquid counter standardised with Sr90 - Y90 and no correction for decay.

Table 35

Radioactivy of Mains Tap Water

(Upland Surface Gathering Ground)

Dates of Collecting Samples		Total Beta Activity (1)	Strontium 90
1964		Picocuries per litre (2)	Picocuries per litre
6, 16, 28th	January	25·2	1·40
12, 25, 28th	February	25·9	
10, 19, 27th	March	22·2	
13, 20, 30th	April	21·5	1·53
11, 20, 27th	May	28·2	
5, 15, 29th	June	32·6	
10, 20, 28th	July	31·9	1·43
5, 18, 25th	August	23·0	
8, 28, 30th	September	17·0	
12, 20, 27th	October	15·6	1·19 (Sr89 = 0·6)
9, 19, 30th	November	11·9	
14, 22, 30th	December	5·6	
	Averages ...	21·7	1·39

(1) The natural potassium present has an activity of approximately 0·4 picocuries per litre.

(2) As measured in a liquid counter standardised with a strontium 90–yttrium 90 standard solution.

Table 36

Strontium 90 in Milk

Month	Number of Milks Sampled	Strontium 90	
1964		Picocuries per kilo	Picocuries per gramme of calcium
January	86	29·0	26·7
February	77	30·5	25·9
March	97	26·1	23·3
April	121	26·6	23·5
May	90	29·6	26·2
June	61	31·6	28·2
July	104	33·7	29·8
August	84	29·5	26·3
September	69	30·5	26·5
October	112	23·3	19·6
November	83	23·7	20·8
December	49	23·3	20·7
Averages		28·1	24·8

Table 37

Strontium 90 in School Dinners

Date 1964	Average Weight of Meal	Average Calcium		Average Strontium 90	
Five Consecutive School Days beginning	Gms.	per cent.	Grammes per day	Picocuries per day	Picocuries per gm. Calcium
10th January ...	246	0·090	0·220	3·85	17·5
13th April ...	540	0·076	0·412	5·9	14·3
17th June ...	548	0·069	0·378	15·3	40·5
9th September ...	457	0·083	0·380	11·6	30·5
19th October ...	475	0·076	0·360	9·7	27·0
7th December ...	287	0·071	0·205	6·4	31·3
Averages ...	425	0·078	0·326	8·8	26·9

Table 38

Strontium 90 in Some Other Foods, 1964

Lab. No.	Sample	Date Purchased	Calcium	Strontium 90	
			per cent.	Picocuries per kilo	Picocuries per gm. Calcium
R.615	Cabbage	23.7.64	0·056	25·5	45·5
R.644	Baby Cereal	30.11.64	0·634	91·0	14·3
R.645	Baby Cereal	30.11.64	0·550	118·0	21·5
R.655	White flour 19 samples	2nd and 4th quarters	0·162	19·5	12·0 (89 on the natural calcium)
R.656	Oatmeal 13 samples	1st and 2nd quarters	0·063	97·0	155

PART VI.—MISCELLANEOUS SAMPLES

This section of the report includes those samples which because of their nature or because of the circumstances under which they were obtained, could not be included in previous sections of the report. Three hundred and fifty-six samples were examined under this heading and they were submitted as follows :—County Medical Officer of Health, 3 ; County Architect, 2 ; County Surveyor, 2 ; Chief Officer County Fire Brigade, 2 ; County Chief Weights and Measures Inspector, 2 ; Divisional Health Committee No. 1, 1 ; Divisional Health Committee No. 10, 3 ; Divisional Health Committee No. 11, 1 ; Preston and Chorley Hospital Management Committee, 3; Whittingham Hospital Management Committee, 2 ; County Borough of Preston, 100 ; County Borough of Southport, 13 ; County Borough of Barrow-in-Furness, 1 ; City of Lancaster, 42 ; Borough of Leigh, 36 ; Borough of Middleton, 4 ; Borough of Chorley, 1 ; Borough of Morecambe and Heysham, 1 ; Urban District of Formby, 12 ; Urban District of Walton-le-Dale, 11 ; Urban District of Thornton Cleveleys, 1 ; Urban District of Kirkby, 1 ; Urban District of Huyton-with-Roby, 1 ; Rural District of Garstang, 2 ; Makerfield Water Board, 2 ; 107 samples were also examined for the information of the Laboratory. The work carried out on some of the more interesting of these samples is discussed briefly in the following paragraphs.

Atmospheric Pollution

During the year 1964, 158 deposits and rainwater from soot gauges were analysed on behalf of the County Borough of Preston, the County Borough of Southport, the City of Lancaster, the Borough of Leigh and the Urban Districts of Formby and Walton-le-Dale. In addition, 48 lead dioxide candles were analysed for the County Borough of Preston.

The standard soot deposit gauge consists of a large glass funnel of known area leading into a bottle large enough to hold a month's rainwater. The soot and rainwater collected are brought into the laboratory at the end of each month for analysis, the minimum number of determinations carried out being those listed in table 39. The sulphur candles are porcelain cylinders of known area which are covered with a layer of lead dioxide prepared under standard conditions. This surface on exposure at the site, reacts chemically with sulphur gases present in the surrounding atmosphere and when it is examined at the end of the month its sulphate content is proportional to the average concentration of corrosive sulphur gases in the air at that point for the whole of the month.

To illustrate the nature and magnitude of the results obtained in the examination of the contents of soot gauges the average monthly figures for the three sites in the Borough of Leigh for the year 1964 are set out in Table 39. The Manchester Road and Firs Maternity Home sites are approximately one mile to the East and West of the central Town Hall site respectively. The weights of insoluble deposit collected by the Manchester Road and Town Hall gauges are very similar to the corresponding weights found for 1963. The insoluble deposit in the Firs Maternity Home site is higher than in the previous year only because of an abnormally high deposit, equivalent to 30·3 tons per square mile, collected in March, 1964.

Table 39

Soot Gauge Observations, 1964

Monthly Averages in Tons per square mile

Site	Borough of Leigh					
	Manchester Road		Town Hall		Firs Maternity Home	
Rainfall in inches ...	2·51		2·78		2·76	
Carbonaceous matter and Tar	2·76	7·56*	5·75	15·99*	3·28	8·41*
Ash	4·80		10·24		5·13	
Soluble Deposit ...	4·64		6·36		5·55	
Total Deposit	12·20		22·35		13·96	
pH.	3·9		4·3		4·0	

*Insoluble Deposit.

The following miscellaneous samples may also prove of interest :—

Mineral Water Bottle, Sample No. M.205

This sample submitted on complaint consisted of a 10 fluid ounce mineral water bottle with a black composition screw stopper. The bottle was empty when received except that it was found to contain 1·5 grammes of broken glass. One of the pieces of glass weighed 1·46 grammes, the remainder being small fragments down to fine powder. The glass bottle itself was intact but the density of the fragments of broken glass were identical with that of the bottle itself, viz. 2·49. Furthermore, the large piece of broken glass was from the top of the rim of the neck of a bottle with similar outside neck curvature and inside neck bevelling to that of the bottle itself. The opinion was expressed that at least the large fragment of broken glass was from the neck of a similar type of bottle to that submitted and the mineral water manufacturers were cautioned.

Honey, Sample No. M.312

This jar of honey had been purchased in the Midlands by a Lancashire resident who submitted it on complaint as soon as it was opened. The honey weighed 17 ounces and was in a partially crystallised condition. Six milligrams of insect fragments were separated from the sample, these included :— one Ant ; two small Beetles, family Cryptophagidae, 2 m.m. long ; 20 fragments of the exoskeleton of a woodlouse and one small piece of the exoskeleton of a wasp. All the fragments were free from body contents and were found not only at the bottom of the jar but also near the surface of the honey and on the inside of the lid of the jar. The findings in relation to this sample were brought to the notice of the Food and Drugs Authority in whose area the honey had been purchased.

Milk, Sample No. M.262

This sample consisted of a full pint-sized bottle of milk submitted by an Autonomous Food and Drugs Authority as the result of a complaint. When received at the Laboratory the metal foil cap of the bottle was firmly in place and did not appear to have been tampered with. Upon examination it was found that 16 insect pupae were attached to the inside of the bottle in an area between 3 to 6 inches from the base of the bottle. There was also a thin discoloured film on part of the inside of the shoulders of the bottle which proved upon microscopical examination to consist of fungus hyphae and sporing heads. A further insect pupa was found floating on the surface of the milk. All the pupae closely resembled in appearance pupae of Drosophila (Lesser Fruit Fly). The insect pupae and the fungus must have been present on the inside surface of the bottle before it was filled with milk. The autonomous authority instituted legal proceedings for a contravention of Regulation 27 of the Milk and Dairies (General) Regulations, 1959, against the dairy company concerned. At the hearing the defendant company pleaded " guilty " and was fined £25.0.0 together with £5.5.0 costs.

Eye Lotion, Sample No. M.206

This sample was submitted, as the result of a complaint that it had caused eye irritation, by an Autonomous Food and Drugs Authority.

The sample was contained in a 2 drachm bottle which was only approximately one-third full when received at the laboratory. Upon examination it was found to consist of a light reddish-brown aqueous suspension weighing 2·54 grammes and containing 0·049 gramme of suspended matter. The supernatant liquid was neutral in reaction and only contained 0·27 per cent. of soluble solids, including a trace of zinc compounds. The suspended matter yielded the following approximate analytical results :—

Zinc Compounds (as $ZnCO_3$)	69
Calcium Carbonate	12
Silica, etc.	19
	100

The sample, therefore, appeared to consist of a suspension of a relatively impure Calamine (basic zinc carbonate). This compound is not normally used as an eye lotion but a very dilute solution (0·25 per cent.) of zinc sulphate is listed for this purpose in the British Pharmaceutical Codex. The 19 per cent. of silica included very fine clay-like material but also some particles of fine sand which could, of course, irritate the eye.

Insects, Sample No. M.165

Three dead insects were submitted by an Autonomous Food and Drugs Authority as the result of a complaint that they had been found in a can of imported blackberries in syrup. They were identified as worker honey-bees and they gave no reaction for phosphatase, which result is consistent with their having been heat processed with the blackberries. The bodies of the insects were impregnated throughout with dark maroon colouring which upon extraction and examination was found to have the characteristics of natural blackberry colouring. The importers apologised for the condition of this can of fruit and the matter was also brought to the notice of the actual packers.

Insects, Samples Nos. M.174 and M.258

Two dead insects were submitted by another Autonomous Food and Drugs Authority following complaints that they had been found in foods. The first insect was found to be a moth which was stated to have been found in a meat pie made at a school canteen. It was sugested by the complainant that it had been delivered in the meat with which the pie was made. The moth was 18 millimetres in length, it was entire, had been heated and was similar to the Heart and Dart moth.

This moth has no connection with food storage. Upon microscopical examination it was found that, in addition to wheat starch, on the surface of the insect there were a few minute bright red spots which were not part of the natural insect colouring and a minute piece (approximately 1 millimetre long) of yellow rayon fibre. Upon investigation it transpired that there was a considerable amount of red painted equipment in the School Canteen and the staff there wear yellow overalls. The examination, therefore, rather suggested that the moth might have got into the pie at the School Canteen and no further action was taken. The second insect consisted of part of the body of a dipterous fly, similar to a blow fly, stated to have been found in a can of imported corned beef. The fly had been heated which was consistent with it being in the can before the contents were processed and the packers were comunicated with and informed of this complaint.

Fragment of Glass, Sample No. M.203

This fragment of glass was submitted by an Autonomous Food and Drugs Authority following a complaint that it had been found in a fish cake. Microscopical traces of wheat and potato starch and muscle fibre were found attached to the piece of glass which weighed 0·30 gramme and measured 11 × 6 × 3·5 millimetres. The density of the glass was 2·520 which is very slightly higher than the normal range for bottle-glass. One side of the fragment bore a flat ground surface arising from which there was a bevelled moulded edge curving upwards which suggested that this glass was from a moulded piece of glass table ware rather than from a glass bottle. In view of the nature of the material attached to the glass, which was consistent with it having been in contact with a fish cake, it was decided to bring this complaint to the notice of both the vendor and the manufacturer.

Animal Feeding Stuffs, Samples Nos. M.263 and M.264

These two samples were taken from the last two sacks, which had already been opened, of a consignment of a compound feeding stuff delivered to a farmer. Samples could not be taken under the Fertilisers and Feeding Stuffs Act but a County Weights and Measures Inspector took the samples because the farmer suspected that the contents of one sack (marked sample A) was of inferior quality to the sample from the other sack (marked sample B). The guaranteed analysis of the consignment was stated to be :—Oil 3·25 per cent., Protein 18·0 per cent., and fibre 6·9 per cent. The reason why the farmer suspected the contents of the sack represented by sample A was that this material was somewhat lighter in colour and visually appeared to contain more fibre than sample B. Upon analysis the samples yielded the following results :—

	Sample A	Sample B
Oil, per cent.	2·55	2·8
Protein, per cent.	17·9	16·4
Fibre, per cent.	7·4	3·9

It will be seen that sample A did contain more fibre than Sample B but sample A also contained more protein and was nearer the guaranteed figures for protein and fibre than sample B. Sample A was therefore actually better than sample B and was not of inferior quality as suspected by the farmer. It should be mentioned moreover that both samples agreed with the guarantee within the limits of variation permitted by the Fertilisers and Feeding Stuffs Regulations.

Plastic Toys, etc.

Seven samples of plastic or painted toys and one child's bracelet were submitted by two Autonomous Authorities and by three Divisional Medical Officers of Health within the County in order to ascertain whether the toys were free from significant amounts of toxic metals, particularly lead, and in the case of the bracelet whether it was free from mercury. A child appeared to be suffering from Pink Disease due to mercury ; the bracelet was submitted as a possible source of this metal but it was found to be absent. The plastic toys were submitted following reports in the press that relatively large amounts of lead had been found in plastic toys imported from the far East. The first sample of toys, No. M.176, submitted, consisted of 5 toys of which only one contained a significant amount of lead, i.e. 225 parts per million, but only one-twentieth of this was soluble in warm 5 per cent. citric acid. Sample No. M.185, submitted by an Autonomous Authority, also consisted of 5 toys. Three were free from significant amounts of lead. A pair of plastic pliers contained no lead in the plastic but the black paint on the handle contained 0·27 per cent. of lead. This amount of lead was within the maximum limit of 1·1 per cent. for lead in the dried film of coating materials for toys stipulated in British Standard No. 3443 : 1961, as amended in 1963. This limit was followed up in January 1964 by an agreement between the Ministry of Health and the Paintmakers Association of Great Britain that a warning label would be used on paints containing more than 1 per cent. of lead to indicate that they should not be used on any surface which might be chewed by children. The remaining toy was a plastic screwdriver which was found to contain total lead amounting to 5,000 parts per million (0·50 per cent.) distributed throughout the plastic material of the toy. Although by far the greater part of the lead would be insoluble because it was protected by the plastic material of the toy it was never-the-less greatly in excess of the maximum limit of 250 parts per million for total lead in plastic toys laid down by the Home Office. Sample No. M.287 consisted of a doll, the paint of the " hair " of which contained 0·83 per cent. of lead ; this figure being just within the British Standard limit mentioned above. Sample No. M.288 consisted of four small plastic or wood toys which were all free from significant amounts of lead. Sample No. M.302 consisted of a plastic toy railway engine which was free from lead but the plastic parts coloured red contained 2,010 parts per million of cadmium of which only 1·3 parts per million was soluble in 5 per cent. citric acid. This amount of soluble cadmium was only one-hundredth of the amount which could be considered permissible having regard to the findings of the Second Report (1962) of the Toxicity Sub-Committee to the British Plastics Federation. Sample No. M.303 was another plastic toy free from lead but it contained 260 parts per million of total cadmium of which none was extractable by 5 per cent. citric acid solution. The last sample, No. M.336, consisted of a teething ring made up of four plastic keys and a plastic ring with a connecting metal chain. The plastic parts were free from toxic metals, including lead, while the metal chain which was nickel plated contained no lead or mercury and yielded no nickel soluble in 5 per cent. citric acid.

In connection with the placing of contracts two samples of antifreeze solutions for use in the cooling systems of motor vehicles were examined for the County Chief Fire Officer in order to ascertain whether they conformed to the requirements of the British Standard Specification 3151 : 1959 for Type B Anti-Freeze (sodium benzoate and sodium nitrite inhibited). Two samples of wood preservative solution were examined for the County Surveyor to determine whether they complied with the British Wood Preserving Association's Standard No. 102 in regard to both the proportions and amounts of copper, arsenic and dichromate present. One sample complied with the standard but the other was deficient in the total amount of the above mentioned constituents. Two samples of soapless detergent solutions were submitted by Whittingham Hospital Management Committee in order to compare their relative cost and efficiency at their respective recommended working strengths. In view of the fact that both solutions were found to contain the same surface-active agent comparison was relatively simple.